Postgraduate Dissertation

Student Number: 1207792

	Comments	Max Mark	Actual Mark
Introduction *Identification of a valid topic, research question and objectives framed to Masters Level standard with academic rationale developed, clear industry contextualisation of the research topic*		**10%**	
Critical Literature Review *Depth and breadth of literature search, engagement with seminal authors and papers, evidence of a critical approach toward the scholarly literature*		**25%**	
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Conclusions and Recommendations *Research question and objectives addressed with implications to theoretical and managerial concepts considered. Recommendations provided for theory, practice and future research*		**10%**	
Organisation, presentation and references. *Well structured and ordered dissertation with correct use of grammar and syntax. In-text citation and bibliography conforming to "Cite Them Right"*		**5%**	
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Artificial Intelligence in the Business of Tourism: A Market Strategy in the UK Travel Distribution

A dissertation submitted in partial fulfilment of the requirements of the Royal Docks School of Business and Law, University of East London for the degree of MSc International Business Management

January 2019

[Word Count: 13,723]

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University of East London
School of Business and Law

Artificial Intelligence in the Business of Tourism: A Market Strategy in the UK Travel Distribution

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Abstract

This study explains the current interest of travellers and business of tourism in Artificial Intelligence. It takes into account how Artificial intelligence disrupts the travel distribution. And, how it impacts on tourist behaviour. The methodology approach in this study employs a descriptive data analysis. It describes the data of UK traveller outbound behaviour and the economic performance of TUI Plc. Thomas Cook Plc. and Booking.com. Besides, the methodology approach includes Critical Realism. It provides a philosophical explanatory of the impact.

This study, concludes that the application of Artificial Intelligence in the business of tourism disrupt the travel distribution. It is in the form of the new Intelligent Travel Agents (ITA). But their services affect travellers heuristics and intuition negatively. It displaces travellers learning and discover new products and services.

Finally, this study makes recommendations. First, it all proposes recommendations to the management of Intelligent Travel Agents. It suggests to match its products and services through Market-bound Self-reinforcing Mechanism. It would create a strategy for developing new traveller segments. It also recommends that Corporate Social Responsibility (CRS) should be at the heart of the Intelligent Travel Agents.

Acknowledgements

In the first place, the author wants to express his gratitude to his supervisor Dr Henrik Linden. Thank you for all the guidance and support.

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Table of Contents

List of Figures

List of Tables

List of Charts

Appendices

Introduction

1.1 Chapter overview

This first chapter illustrates the structure of the present study introducing to the research. This chapter is structured in three main sections. The first section introduces the contents of the literature review. It briefly explains the impact of Artificial Intelligence in the Travel Distribution and traveller behaviour. Moreover, it provides the background of the present study. The next section resumes the methodology used in this study. This section includes data collection, philosophy, and theoretical frameworks. Next section, briefly explains the philosophic systematic data analysis process. This section refers to findings and result chapter. Finally, this first chapter concludes with the research background, research question and objectives.

1.2 Background and Research Question

The recent impact of Artificial Intelligence (AI) on the business of tourism is widely recognised and debated. But, the shape of its future is not yet definite. There are some reasons to think that the UK government is one of the first countries creating an AI Council (Parliament UK, 2018). AI represents a potential disruption in the whole nation industry. It also includes the UK travel distribution. And especially, AI impacts on the traveller behaviour. Despite being based on computer science, Artificial Intelligence has significant links with other subjects sections. It includes sociology, philosophy, psychology, cognition, and others.

In the UK, large tour operators and startups compete with each other employing Artificial Intelligence. They create smart market strategies. These 'intelligent strategies' aim to disrupt the UK travel distribution. It also aim to influence in the traveller behaviour. Large corporations such as Virgin Holidays employ Artificial Intelligence, e.g. Alexa powered by Artificial Intelligence (Newman, 2017). On the other hand, startups such as KAYAK and Booking.com and compete against these large corporations to expand their products and services in UK traveller distribution.

These startups have developed radical innovation of services in optimisation and personalisation of products and services in the UK travel distribution. As a consequence, the following question leads the present research:

In what ways do Artificial Intelligence disrupt the travel distribution and impact on the traveller behaviour?

1.2 Objectives and Research Outline

The objectives are in addition to the leading research question. It identifies key factors of Artificial Intelligence disrupting the travel distribution. And how that impacts in traveller behaviour. The design of the objectives includes the impacts on the traveller knowledge on travel products and services. Therefore the focus of the objectives is on how traveller behaviour is influenced by Artificial Intelligence. It also introduces traveller knowledge expertise. Finally, the objectives are set to identify disrupting factors. Thus of the Artificial Intelligence in the travel distribution.

I. To identify key factors of Artificial Intelligence disrupting the travel distribution

II. To critically appraise Travel Knowledge Engineering

III. To critically identify the role of Artificial Intelligence in the tourism distribution

IV. To investigate the impact of Virtual Personal Assistants in the tourism distribution.

V. To examine how Artificial Intelligence impacts traveller behaviour

The present study is composed of four main chapters. First the literature review chapter. Second methodology chapter. Third data findings and results chapter. Fourth conclusion and recommendations chapter. These chapters are outlined in complement with the conceived research objectives.

1.4 Literature review

The literature review chapter critically analyses the recent events of the Artificial Intelligence (AI) in the business of tourism. It takes into account the travel distribution and travel behaviour. This chapter focused first it all on the strategies of the Menzi and KAYAK startups as Intelligent Travel agency (ITA). Then, the literature review shows how these startups apply AI to optimise and personalise products and services in real-time. As an example, the literature review included we.are.expensify.com startup which optimises travellers budget. As noted the optimisation of the traveller budget improves their travel behaviour. This chapter interprets the strategy created by these new startups to disrupt the travel distribution. It shows new 'intelligent' services creating new markets. The creation of the new markets in the UK travel distribution would lead to a new typology of travellers. It will, therefore, create a demand for the development of new AI travel organisations. The literature shows how these Intelligent Travel Agents disrupt the travel distribution matching travellers' product and services. In line along the travel distribution. It is according to the traveller demand and budget in real-time. Consequently, the influence of Intelligent Travel Agents (ITA) services impact the travel behaviour, and therefore, trade patterns which certain disrupt the travel distribution.

The literature review chapter critics the potential misleading of the Intelligent Travel Agents. It shows how these startups employ Artificial Intelligence which learns through data (algorithms). It that might bias traveller learning teaching bad practices. Therefore the literature review proved it is a critical issue. Intelligent Travel Agents takes into account travellers' cognitive and emotional learning factors. It manages their evaluative criteria of products and services along the travel distribution. Consequently, it will affect travellers heuristics and learn intuition. That represents an issue for travellers at the time to discover new products and services by themselves.

1.4 Methodology

The third chapter is concerned with the methodology used for this study. It explains and justifies its research methods. It also includes the research design, secondary official statistics data collection techniques. Besides, this chapter explains the purpose of the Descriptive Statistical technique to data analysis. It, therefore, justifies the research strategy; that orientated in analysing quantitative secondary data. Also, the methodology chapter argues that the present study is one of the first research of its kind. It undertakes a longitudinal data analysis of shares values of top organisation Intermediaries in the UK tourism distribution. And outbound UK traveller behaviour data both with Critical Realism philosophy.

The methodological approach taken in this study explains the philosophy of the present research study. It is designed to identify and describe the underlying generative mechanism. Critical Realism does not aim to uncover general laws. It is clear from the Critical Realism perspective that the role of modelling. It should be that of explanation and understanding rather than prediction. Critical realism ontology mechanism explanation is not a form of fundamentalist explanation. It does not need to be localised in an essentially natural sense. But Critical Realism shows that the causal mechanism needs to be defined, and separated, in their space of interaction. Besides this chapter, describe the ontology and epistemology of Critical Realism. It highlights that layered ontology is the focus of the present critical realist methodology.
Finally, the methodology chapter includes the reliability and validity section. This section discusses the importance of choice of a sample method. It refers that the sample the method determines the quality of the study. Overall, it gives value to the quality of the research findings and reliability and validity.

1.5 Findings and Results

Data findings and Results chapter is organised according to with the Critical realism philosophic systematic process. That process is along five steps and two sub-steps. In the first step, description of the events, the chapter interpret descriptive statistical data to describe the essential features of the UK traveller behaviour. It also interprets descriptive statistics economic shares values of top organisations in the UK travel distributions. The second step 'Abstract' identify the key components in the UK traveller distribution and travel segments. In the UK traveller distribution. This step, identify the disruption of Booking.com (Booking Holdings Inc.) a $102 billion company (Schaal, 2018) getting close overcome TUI Travel Plc and Thomas Cook Plc. It identifies that Booking.com shares prices raised stable along six years (2013-2018). Finally, this step interprets domestic and outbound travellers markets descriptive statistical that identify two key UK traveller segments Aspirational Family Fun and Free and Easy Mini-breakers.

Finally, this step, identify that the most significant and fastest outbound market visit Spain. In the next step (step third), abduction puzzle the disruptive events and theorise the impact of Artificial intelligence in both traveller distribution and traveller behaviour. This step creates a theory based on the literature review and data analysis. Then, in the fourth step Identification of Candidate Mechanism, the research question is answered, and the objectives achieved. And so, based on the findings, and the theory abducted, this step, identify several generative mechanisms. Step four incorporate a sub-step that in search of Macro and Micro mechanism where the two deduced research objectives are analysed to find out their relationship and find a key generative mechanism. This step unveils the 'Market-bound self-reinforcing mechanism' which embraces the traveller behaviour interaction and business network in the traveller distribution. In step five Analysis of Selected Mechanism and Outcomes, this study interprets the generative mechanism of Intelligent Travel Agents (ITA) in tandem with the literature review theories. In the end,

the last step (step six) Validation of Explanatory Power, justify Market-bound self-reinforcing mechanism’ as a candidate theory generative mechanism. This theory generative includes ‘interaction effects and network effects; ‘interaction effect’ for traveller behaviour, and ‘network effect’ for the travel distribution.

2. Literature Review

2.1 Overview

The literature review chapter critically analyses the recent events of the Artificial Intelligence (AI) in the business of tourism. It takes into account the travel distribution and travel behaviour. This chapter focused first it all on the strategies of the Menzi and KAYAK startups as Intelligent Travel agency (ITA). Then, the literature review shows how these startups apply AI to optimise and personalise products and services in real-time.

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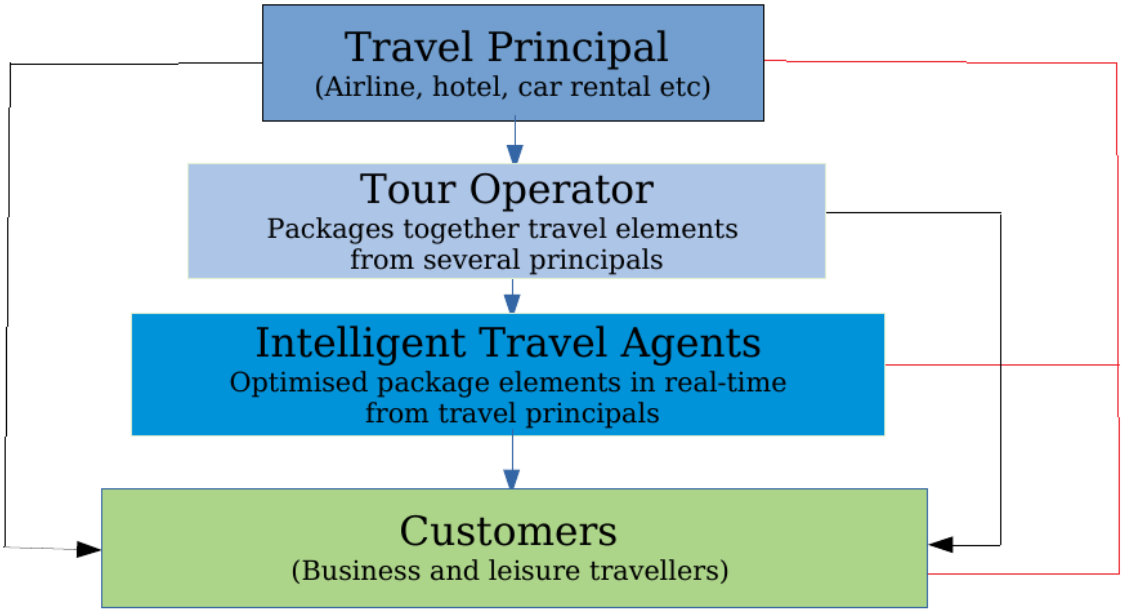
2.1 Artificial Intelligence and the Travel Distribution

Startups and large corporations show interest in Artificial Intelligent technology. It relates the first serious discussions of Alan Turing. He stated that a computer would deserve to be called intelligent if it could deceive a human into assuming that it was human (Chahal, Kaur and Kaur, 2012). The first interest in Artificial Intelligence started at the beginning of the cold war era. According to Anand and Kumar, (2017) in 1950 Alan Turing spoke about Artificial Intelligence (AI) technology. It highlighted how computers could think like humans. Since Alan Turing speech, AI is frequently applied to developing systems with similar processes and characteristics of human thinking. ITB Berlin, (2017) defines Artificial Intelligence as neural networks computer programs. It is assembled from hundreds, thousands, and even millions of artificial brain cells.

Consequently, Artificial Intelligence (AI) can reason to discover meanings. And most importantly it learns to solve problems. The outcome of AI is data analysis and patterns recognition. Li et al., (2018) explain that Artificial Intelligence strategic techniques such as ‘online mining’ have been adopted to extract and analyse vast useful textual data information. Hence, there is some evidence to argue that organisations in the travel distribution adopted such Artificial Intelligence analytic methods and other techniques. They mostly it for market and marketing strategies purposes. Floater and Mackie (2016) believes that AI technology such as Machine Learning (ML) along data mining disrupt traveller(s) behaviour patterns. These disruptions impact tourism business trading. It processes real-time data analysis of consumer preferences. It responses to their travel requests in real-time. (Sung, 2017) points out that these disruptive factors and drivers include the impressive rise in data, computational power, and connectivity.

Figure 1 – Tourism Business Chain of Distribution



Adapted from source: Holloway and Humphreys, (2012p.184)

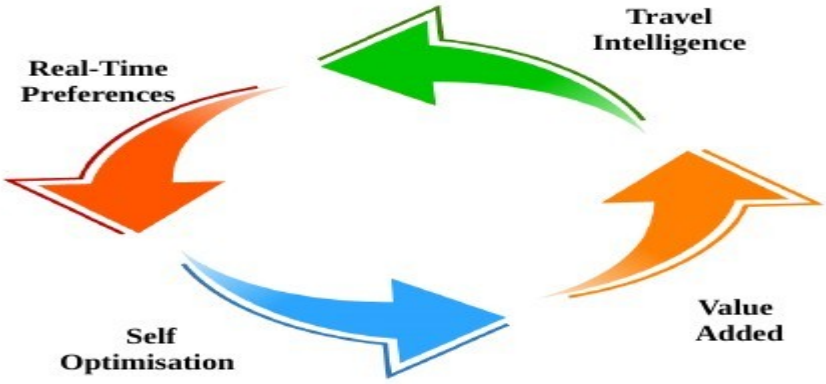
Intelligent Travel Agents (ITA) represent a radical innovation. It optimises travel purchase behaviour in real-time. (Markides, 2006) believes that radical innovations are disruptive to current habits and behaviour. Intelligent Travel Agents in a significant way enable travellers to order their personalised products and services in real-time. It allows them to serve small traveller market segments. And it enables organisations to work with limited or unsold finished goods inventory. It disrupts traveller purchase behaviour in many ways. For example KAYAK (2018) states that travellers using KAYAK services receive real-time notifications for gate changes flight. It suggests actions in real-time be taken in delays or check-in status. All of it not even leaving Facebook. Therefore, these ITA disrupt travellers behaviour by providing 'smart services'. KAYAK as an Intelligent Travel Agents employs Machine Learning (ML). It learns traveller preferences from social platforms such as Facebook, Twitter, Google. Also, KAYAK has participated in the development of the new travel start-up called Lola.com. It is also supported by Artificial Intelligence (Fitzpatrick, 2016). Therefore, these Intelligent Travel Agents start-ups make

minor but new notable changes. Virgin Holidays compete against Intelligent Travel Agents (ITA) that launched a cloud-based voice service Alexa.
It allows holidaymakers to ask ‘Alexa’ to search Virgin products and services for their next trip. They book their holidays through devices including Amazon Echo and Echo Dot (Newman, 2017).

2.2 Travel Knowledge Engineering

There are reasons to ask why the Artificial Intelligence (AI) has become influential in the business of tourism. In the first place, this technology encapsulates systems of computational entities. It deals at the different level of knowledge complexity. ITB Berlin, (2017) argues that is an essential character in delivering personalised content. On the other hand Ossowski and Omicini, (2002) claim that the design of AI systems from a knowledge engineering perspective and structure knowledge-level approach. It evaluates various types of knowledge. Artificial Intelligence (AI) therefore, learn at different knowledge levels. It learns according to the traveller knowledge level. However, intelligent entities such as Machine Learning (ML) learn from new information or data without having to be explicitly programmed (Eggleton, 2017). Consequently, the application of AI Knowledge Engineering in the traveller behaviour assist the need of heuristic search according to the traveller.

Figure 2 – Travel Intelligence



Adapted from Caldito and Dimanche (2016)

In this sense, travellers demand self-update by learning continuously. It solves problems in a repetitive manner (White, 2018). Artificial Intelligence learns how to solve problems and defines products and services for travellers. Therefore, it affects individual heuristic displacing the human intuition to learn and discover. Travel intelligence 'heuristic' means personalised learning processes of product and services. It includes smart services in real-time across the traveller life-cycle. According to Grosz et al., (2015) Newell and Simon pioneered the foray into heuristic search, an efficient procedure for finding General Problem Solver solutions.

2.2.1 Real-Time Preferences and Self-optimisation

In the business of tourism travel solving problems in real-time has become significantly important. Artificial Intelligence creates expense reports and solves expenditure problems in real-time. For example, travel concierges such as 'we.are.expensify.com' automate each spending from the time travellers acquire travel bookings (Expensify, 2018). It creates values in the context of a real-time case by traveller expenditure interaction preferences. According to Mehmetoglu (2004)) there is no such thing as the traveller or the traveller and, within the context of the modern tourism system. It may be concluded that a tourist is one type of traveller. Solving problems in real-time leads to expenditure optimisation. It reduces time in searching troubleshooting. Most importantly travel solving problems in real-time develops new product and services. Francis, Bessant and Hobday, (2003) believe that real-time preferences products and services in tourism creates the effective real-time control and successfully grasp novel objects and corrects mistakes by continuous serving. Consequently, travellers become their travel agents and build their travel packages themselves. Intelligent Travel agents such as Alexa become popular with real-time solutions with more flexibility in travel behaviour. Hence, real-time preferences and self-optimisation add values in a linear combination of products services. It creates richer product bundles and new per-

sonalised service quality for travellers. It will impact traveller behaviour and therefore businesses. It will be creating new mergers and acquisitions in the business of the tourism market.

2.2.3 Value Added

The concept of value-added is the bundle of products and services. (Libreros, 2004) define value added as the value added generated in the process of production. It is in response to tourism consumption (please refer to figure 1). However, there a wide range of consumers' information value perception. That sophisticated and multi-layered travel behaviour and besides functional (Jung *et al.*, 2018). In the whole, this represents the multidimensional aspect of the traveller market segmentation. And it is traveller behaviour. It will, therefore, confirm that Intelligent Travel Agents interpret the value perceived of humans. Those adapt its behaviour to them. (Chhabra, Healy and Sills, 2003) believes that perceived authenticity in tourism is related to expenditure.

2.3 Integrating Travel Distribution

Although the travel distribution is dynamic and changes in short periods of times. Today, it witnesses an acceleration integrating its products and services. As a consequence, large organisations such as the Virgin Holidays (as mentioned earlier) has integrated its sales to a new channel of sales. It is in Alexa that a cloud-based voice system sells Virgin Holidays's travel products and services. Haddud et al., (2017) consider a challenge the integration of travel products and services. That because it should blend business processes, information and communication technologies in the cyberspace. Cyber-Physical Systems has the potential to integrate services in the travel distribution in which its businesses share information. It will integrate with private and public sectors, carriers, constructed attractions, and accommodation.

Therefore, Cyber-Physical Systems might demonstrate 'Smart' industrial behaviour such as Industry 4.0. Raikov, (2018) Argues that Artificial Intelligence seeks solutions in a logical and discrete form blending systems such as Big

Data, Deep Learning, Experts' systems, and the Internet of Things (IoT) in the Cyberspace. Jin et al. (2017) argue that blending systems algorithms would learn from each other new failures modes change improving itself to be more robust and reliable. Therefore, Cyber-Physical Systems algorithms will be more adaptive to accommodate dynamic business operations. Therefore, this challenge is similar to Industry 4.0 in which Artificial Intelligent integrate systems in the cyberspace. It exchanges data to rectify problems in a network structure to optimise the business travel distribution in real-time.

2.3.1 Intelligence Control and Chatbots

The intelligence control of tourism distribution organisations consists of the consolidation and optimisation of different levels. Bond, (2017) argues that corporations are building apps skills for Alexa, including the Campbell Soup Company, Domino’s Pizza, Uber and Capital. That allows people to order food or a ride, and check their bank balances. All of it by merely speaking to a voice-enabled device. However, Virgin Holidays invested in Alexa but only searches on Virgin Holiday's group databases. It avoids competitors sales. In this sense, intelligence control of tourism distribution is limited to Virgin organisations databases. It leaves a market niche for independent entrepreneurs. Those developing Virtual Personal Assistants powered by Artificial Intelligence. Markides, (2006) believes that radical innovations stabilised organisations should nurture network firms. It suggests that young, entrepreneurial firms busy colonise new market niches.

Consequently, radical innovators such as Imimr Systems (www.imimr.biz) create Virtual Personal Assistants (Chat-bots) powered by Artificial Intelligence. It might participate conquering the niche on the business tourism market. Imimr Systems Chat bots such as ‘Travel by chat’ and ‘Book by chat’ both for commercial use. It can be used to reorganise tourism products and services matching products and services through Cyber-Physical Systems. Imimr Systems help the customer to do Chat Commerce for better customer experience and engagement. Imimr Systems, (2019) argue that we made Chatbots with AI

and NLP technology across various channels like Facebook Messenger, WeChat, Line, and Telegraph.

2.3.2 Management of Personalised Services

According to recent events, Artificial Intelligent in the business of tourism satisfies broader traveller demands. Intelligent travel agents such as Mezi.com have set goals to visualise the future making choices that maximise the utility and value of Artificial Intelligence (AI). According to (D'Ambrosio, 2018) Mezi works with a handful of travel management firms including Adelman Travel. American Express Co. also works with Mezi proving services for its Platinum card member 'concierge service'. It will, therefore, change tourism business management form. So it will cause the emerge a new business venture. Mandal, (2016) argues that in the hospitality industry hotels employ consolidated data. It comprises personalised services of hotel guests. That analysed by Artificial Intelligence reveal buying trends. This data analysis provides strategic anticipation. It includes needs and wants of hotel guest. It will be predicting purchasing motives.

2.4 Virtual Personal Assistants

Popular Virtual Personal Assistants (VPA) currently include the aforementioned Amazon Alexa, Goole Now, Lola.com, and Mezi.com. These VPA powered by Artificial Intelligence are already being integrated into mobile devices. It provides on-demand knowledge travel services. According to Fildes, (2017) Virtual Personal Assistants (VPA) include of voice-activated functions developed around Amazon's Alexa, adopted by Huawei, and Google Assistant. Virtual Personal Assistants, understand natural language voice controls and processes knowledge acquisition. These generate rules to apply data in order to imitate the thought process of human experts building knowledge-based systems. In contrast, (Portugal, Alencar and Cowan, (2018) argues that computers do not learn by reasoning. But it learns through algorithms. The design of the Machine Learning (ML) is to imitate human expert. It creates knowledge of the problem solving into a program providing smart decision-making.

Even so, the quality of ML algorithms denote the characteristics of the traveller heuristic. The heuristic determines the least time-consuming position in the holidays (Souffriau, 2008). It is a key aspect of a ‘Travel Intelligence’ offered by the mentioned Intelligent Travel Agents. These are moving toward Intelligent Travel services. For instance, Hipmunk.com travel services use AI to learn its users’ preferences. It searches the web for the best matching. It searches through user calendars to build their itinerary (Bump, 2018).

2.4.1 Tourism Taxonomy

Taxonomy is a critical subject in Artificial Intelligence. It is also essential to the travel distribution organisations. That represents expertise in tourism learning. In this sense, travel consultant organisations invest in human empirical taxonomy — those rather than Virtual Personal Assistants powered by Artificial Intelligence technology. For example, specialised recruitment travel agents seek a human Arabic Speaking Virtual Personal Assistant. It must be knowledgeable Arabic and English speaking VIP service specialists experienced working with Ultra High Net Worth Individual (UHNI). It needs also be knowledgeable about the Middle East cultures (C&M Travel Recruitment, 2018). This case reveals that upper class. In general terms tourist does not venture into an unknown and untested territory unless previous travellers have purchased the product before or the product has received a positive word of mouth (Bolan and Williams, 2008). Even so, taxonomy in the tourism market broad the sense of tourist classifications. But it is more strictly in the traveller market segmentation. This concern the marketing purpose convenient to categorise and segment demand. It is distinguished into four distinct set of variables geographic, demographic, psychographic and behavioural (J. Christopher. Holloway and Humphreys, 2012 p.75). Therefore, tourism taxonomy provides the principles of systematic tourism market segmentation. That sets up arrangements of the kinds of products and services in hierarchies. It organises form superior to subordinate groups. Thus according to the market variables. Caldito and Dimanche (2016) argue different tourists behave in a very diverse way, that is why the need for tourists’ segmentation to be able to

please different type of tourists with a wide range of expectations, needs, and wants. Therefore, each of the tourists market segmentation has its reality and lexicon.

2.5 Intelligent Traveller Behaviour

Understanding travel behaviour assists businesses of tourism to design their products and services. It also improves their marketing strategies and satisfies their clients. Solomon, Russel-Bennet and Pretive, (2010) believe that marketers listen to the people in their markets. They do that as never before defining customer segments. In this vein, travel behaviour issues challenge destination marketers. It also challenges tourism organisations in their marketing strategies. For example, as a generation that wants to be in control of what it experiences, Millennials are strongly driven by search. They are on a quest for just the right experience that fits their mood. And in their interest and personality (Nielsen, 2017). These issues include different channels of purchases. It is the constant development of holiday package elements. Those such as flights, accommodation, and sightseeing. Imire and Bednar, (2013) argue the idea of an Artificially Intelligent personal system that supports the user preferences. It is a subject section that is continuously expanding. And it is crying out for attention. Therefore, there are consequences of the emergence of Artificial Intelligence technologies in travelling. Thus on traveller behaviour which will influence the travel lifecycle.

Figure 3 – Intelligent Travel Lifecycle

Adapted form source: Kozak and Martin (2012)

2.5.1 Pre-Journey

In the pre-journey stage, Artificial Intelligence or Machine Learning travellers appraise holiday destinations. It begins to research for travel information and envisage a range of destinations. Caldito and Dimanche, (2016) argues travellers evaluate the information in the light of the past experiences and current knowledge. It also influences their personality, budgets, moral values and so forth. Travellers also evaluate external elements such as culture, and opinions of their affinity groups. That specially from family and friends, peers, neighbours opinions. According to Stange (2013) Although, many industries sell products with essential experience components tourism depends more than others. Those are on the traveller experience. Therefore in the pre-journey stage travellers search and planning. They capture attention and interest. Gidley, (2017) stress that Dr Nigel Jones said Virtual Reality become affordable and accessible appealing to travellers. It enabled people to interact with a location or attraction. They might otherwise not consider visiting. In conclusion, in the pre-journey potentially travellers can visualise their destination. That previously matched by Machine Learning.

2.5.2 On-Place

After the procedure of destination choice and type of accommodations and activities, travellers arrive at their places. On their places such as smart cities. These are starting using Artificial Intelligence (AI). According to Ark, (2018) algorithmic bias AI gets smarter the more data you feed it. But it quickly learns biases and those embedded in our society. Therefore, it will decrease safety and prevention which requires creativity and diligence. Ossowski and Omicini, (2002) argue that local knowledge needs to be attributed to the encapsulated computational entities, or agents, to explain their behaviour concerning a supposed social goal. This local knowledge goal is linked traveller stimuli. That is evaluated depending on personal preferences and internal characteristics. At the time it choose that one option which, a priori, maximise utility. And it is his/her Personal Learning satisfaction. Leading role models in technology management including Facebook's Mark Zuckerberg encourage Personal Learning, donating large sums of their fortunes investing in research and innovation (Shaw, 2018). Another critical issue to consider is that travellers will be affected by cognitive and emotional situational factors learning the evaluative criteria features or desired characteristics of a product required to meet their needs.

2.5.3 After Journey

In the After journey stage, travellers reflect on their experiences. Then they communicate their satisfaction or dissatisfaction. They mostly reflect on the participation of other travellers on social platforms. To mention few Tripadvisor, Facebook, Twitter, and so forth. (Navío-Marco, Ruiz-Gómez and Sevilla-Sevilla, (2018) argue that online social networks (OSN) are generating collective awareness. They are becoming one of the primary sources used by travellers for compiling information. At the time of travelling decision-making purchasing products and services. Those bundled in their journeys.

Consequently, these OSN reflections are the knowledge-based source for Intelligent Travel Agent (please refer sections 2.2.1 and 2.4). It creates, there-

fore, a source to gain knowledge and expertise. Just not only in their after journey state, but along with their travel lifecycle. It is the determinant guidance of Artificial Intelligence in solving problems. However, this 'Intelligent Travel Service' creates socio-economic issues. Waters, (2018) stresses that Prof Newport is concerned about next generations "It is almost certainly true that young people are suffering a rapid decline in their ability to concentrate'. The increment information overloads affect travellers satisfaction stopping them to focus and select the right product and service. However, Artificial Intelligence or Machine Learning organise traveller behaviour. That is a useful variable to learn and define tourism products and services. It includes travellers segment markets. And it increments efficiently use tourism resources.

2.6 Summary

The principal objective of the literature review gave a critical evaluation of how the Artificial Intelligence (AI) impact on the business of tourism. It showed that Artificial Intelligence in the travel distribution has the qualities to revolutionise traveller behaviour. It provides knowledge to the traveller along their travel life-cycle. It argued that travel knowledge engineering highlights the importance of Machine Learning delivering personalised knowledge contents. Those addressed to a different type of travellers at different levels.

On the other hand, several critical aspects it has to be considered. First, is that how travellers will be affected by the Artificial Intelligence. And what features compose AI algorithms. These suppress traveller cognitive and emotional situational faculties. It affects his/her learning and the evaluative criteria features. In addition to algorithmic bias AI safety and prevention that learn biases rooted in the society. On the positive aspects, Artificial Intelligence disrupts the travel distribution influencing in the travel life-cycle. It is already happening with the interaction of chatbot and Virtual Personal Assistants.

Nevertheless, this new technological revolution gives a chance to the Intelligent Travel Agents start-ups. These startups can disrupt large tour operators

such as Thomas Cook Plc and TUI Travel Plc. It represents the importance of Artificial Intelligence integrating the travel distribution. The integration of travel products and services represented a competitive advantage. As shown in figure 1 Intelligent Travel Agent blurred the functions between tour operators and travel agents. The integration of products and services created real-time values. Preferences real-time values lead expense optimisation, time reduction, and new product development.

3. Research Methodology

3.1 Overview

This chapter discusses research methodologies to determine the appropriateness of the chosen research methodology. Collis and Hussey (2009 p.73) define the research methodology as an approach to the process of the research, encompassing a body of methods. In this sense, methodology embrace and articulable the body of methods these within the research strategy, research philosophy, and research design. To sum up, the research methodology is the process and techniques applied to identify, select, operate, and analyse information about a subject. The research question of the present study stresses the role of Artificial Intelligence in the UK travel distribution and impact on UK traveller behaviour.

In what ways does Artificial Intelligence disrupt the travel distribution and impact on traveller behaviour?

The literature review found that independent start-ups providing optimised real-time travel services, and knowledge engineering (machine learning versus human) challenge well-established tour operators. Consequently, the growing sophistication of ‘Intelligent Travel Assistants’ change travel behaviour and shift greater power to those players who control the technology (Floater and Mackie, 2016). Therefore, the following two research objectives are deducted from the initial five.

- To critically identify the role of Artificial Intelligence in the UK travel distribution.
- To examine the ways in which Artificial Intelligence can impact UK traveller behaviour.

3.2 Research Strategy

The present study as a research strategy involves an all-encompassing method. It covers the logic of design, data collection techniques and specific approaches to data analysis. Therefore, the present research strategy means to establish the general position of the research study. First, the present study includes the data collection of secondary official quantitative data. According to Alan Bryman and Bell, (2015 p.37)quantitative research is a research strategy that stress quantification to the conduct of business research. That denotes the orientation of the research analysing quantitative secondary data collected from existing sources. It includes publications, databases and internal records (Collis and Hussey, 2009).

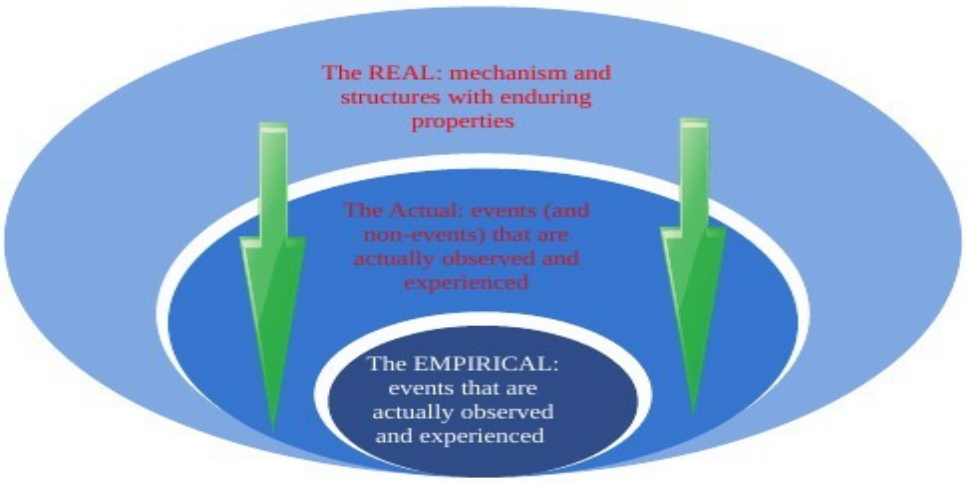
Second, the research strategy includes the approach of longitudinal analysis in the official secondary data. It is one of the first studies to undertake longitudinal analysis of the UK the tourism distribution, and the UK travel behaviour. This longitudinal data analysis approach unfolds and related disruption events of the Artificial Intelligence. Within a creative and more in-depth systematic data analysis over a five year processing the identifications of patterns.

Third, Critical realism is the philosophical research position of the present study. That is a specific form of realism which recognises the reality of the natural order and the events of and discourses of the social world’. The outcome of a generative mechanism is contextual, i.e. depends on other mechanisms in different contexts. This contingent causality is integrated into all open systems and suggests that it can provide mainly mechanism to explain the phenomena but not to predict them. Critical realist methodology has at its centre generative mechanisms. At a global level, a mechanism is a causal structure that can trigger events (Bhaskar, 2008). However, at a further specific methodological level, the knowledge of mechanisms is increasingly challenging (Bygstad and Munkvold, 2011a).

3.2.1 Ontology and Epistemology

Layered ontology is at the centre of the present critical realist methodology. Different from positivist research the present study does not investigate regularities at the level of events. But alternatively, expose and describe the mechanisms that produce events. Critical realism combines a realist ontology with an interpretive epistemology. It stresses that point although a real world exists, our knowledge of it is socially constructed and fallible (Bygstad and Munkvold, 2011a). Moreover, Mingers, 2014 p.54) argue that the process of abduction and retroduction is a creative, but systematic process. That has at its heart the idea of generative causality via a causal mechanism which possesses powers or tendencies to behave in particular ways. It states that the first sort of stratification is between structures or mechanism; The events that they generate; and the subset of events that experiences. These are illustrated as the dominants of the Real the Actual and the Empirical (please refer figure 4). The Real incorporate the whole reality, events and experiences; the Actual contain events that are observed or experienced, and the Actual takes into account the empirical, these events that are observed and experienced.

Figure 4 – the Real, the Actual, the Empirical



Adapted from: Mingers (2014, p.19)

Therefore, Critical Realism philosophy replaces the classical epistemology and ontology. That re-describes the observable everyday objects of social science.

It usually provided by observational statistic data in an abstracted and more general sense. With the purpose to describe the sequence of causation that gives rise to the observed mechanism, in tandem with theory identified in the literature review. To produce the most plausible explanation of the mechanism that caused the events (Edwards, O'Mahoney and Vincent, 2014 p.16).

3.3 Research Philosophy

Critical realism is the philosophical research position of the present study. It is 'a particular form of realism which understands the reality of the natural order and the events of and discourses of the social world' (Bryman and Bell 2015 p.29). According to Roy Bhaskar, the creator of Critical Realism philosophy, the structures of the social world and natural can be only identified through socials sciences. Therefore, the basic principle of realist philosophy of science perception provides access to things and experimental activity access. Into infrastructures that exist separately of individuals(Bhaskar, 2008). In this vein, the application of Critical Realism in the present study covers two fields. The first will deal with the social aspect of traveller behaviour. And the Second take into account the tourism business utilising Artificial Intelligence in the travel distribution. Edwards, O'Mahoney and Vincent (2014).Critical Realism emphasis on correlations between variables that researchers rarely explore the causal mechanism that is implied by the filed of theories. They propose some strategies for study mechanisms directly as a means of providing more satisfactory explanations. Therefore, Critical Realist identifies structures in the travel distribution and generate insights into the traveller behaviour to identify a key causal disruptive mechanism. Bygstad and Munkvold (2011b) note that critical realism does not aim to uncover general laws but to understand and explain the underlying mechanisms. In conclusion, Critical Realism aims to crystallise and render the nature of the mechanism fitting together. It makes clear mechanisms through consistently and effective data analysis and literature review. To achieve research objectives and answer the research question.

3.4 Research Methodology

Research methodology justifies the choices of research instruments applied in the present study. The concept of Artificial Intelligence is a new phenomenon in the travel distribution and industry, therefore, the present research analyses secondary data analysis rather than primary data. The present study takes into account UK outbound and domestic travel behaviour markets, it, therefore, needs secondary quantitative statistics data from large institutions. Quantitative data are data in a nominal form, and Qualitative data are data numerical form (Collis and Hussey, 2009). In contrast to qualitative and quantitative data collection positivist study can be quantitative that is the data in a numerical form and or qualitative that is in a nominal form such as words images, and so on). Therefore quantitative research strategy in the present study includes data descriptive analysis Destination Management)organisations (DMO) including www.visitbritain.org, and https://data.gov.uk/publisher/visit-england. These sources provide large databases to analyse the traveller behaviour in the UK tourism market.

Descriptive statistical calculations either support or reject the findings in the chapter of the literature review. That means the concepts of Artificial Intelligence disrupting the travel distribution and the impact of that on the traveller behaviour cannot be measured. So there is a link with methodology and the epistemological and ontological positions that are supporting on the methods select for the present research. It is clear from a Critical Realism perspective that the role of modelling should be that of explanation and understanding rather than prediction (Mingers, 2014 p.173). Positivist and constructionist research tends to prioritise epistemology over ontology by generating theory through the description of empirical data. As neither position allows the existence of a causal mechanism, their explanations can only refer to what is e evidenced empirically. In conclusion, the research methodology is not designed to solve any problem in the travel distribution nor the UK traveller behaviour .

Table 1 – Types of Purposes for Research

Exploratory	finding out what is happening, seeking new insights and generating ideas and hypotheses for new research.
Descriptive	portraying a situation or phenomenon
Explanatory	seeking an explanation of a situation or a problem, mostly but not necessary in the form of a causal relationship
Improving	trying to improve a certain aspect of the studied phenomenon

Adapted Source: (Runeson and Höst, 2009)

The research purpose 'explanatory and speculative' explaining in creative thinking the disruption of Artificial Intelligence on the UK traveller distribution structures and identifies the new mechanism. Consequently, outsider speculative explanatory research is appropriate for collecting and analysing quantitative data to explain short sequences and speculate the development of Artificial Intelligence in the UK travel distribution.

3.4 Research Paradigm

The research paradigm methodology is a philosophical and theoretical framework guided by laws and beliefs. The present research has the challenge to interpret the subject of traveller behaviour that is difficult and generally subject to limitations. The ontological assumption is concerned with the nature of reality: Positivist believe social reality is objective and experimental to the researcher (Collis and Hussey, 2009 p.58). However, from the Critical Realism perspective social effects do not exist independently they interact with each other by causal mechanisms. The causal mechanisms are themselves the result of social activities which include traveller behaviour (s). In contrast Bhaskar (2008) 'hold that view social operations do not affect laws of the natural world; causal laws existed and acted independently of human beings but not causality or natural lawfulness. Therefore, social structures such as traveller behaviour do not exist independently of the activities they decide, or, put some other way, and they exist only in their effects or occurrences. It is, therefore, requires some degree of interpretation and understanding of the meaning of the traveller behaviour actions undertaken.

In conclusion, Critical realism combines a realist ontology with an interpretive epistemology (Bhaskar 1998; Archer 1995); although a real world exists, our knowledge of it is socially constructed and fallible (Bygstad and Munkvold, 2011a). Epistemology concern the assumption of what a discipline accepts as valid knowledge. To sum up, Critical realism ontology mechanism explanation is not a form of fundamentalist explanation and do not have to localise in a purely physical sense. Although the causal mechanism needs to be bounded, and demarcated, within their space of interaction.

3.5 Research Design

To get the most valid findings the research design including Critical Realism that is the ‘since and art’ creative thinking of planning procedures for conducting studies (Collis and Hussey, 2009). The present study has reduced in two objectives rather than other research of this genre; but as a generative mechanism, the process of organisational development it shows the origin of what became reproduced and important business innovation (Edwards, O’Mahoney and Vincent, 2014 p.34). Therefore, it illustrates causal connections in the UK travel distribution and traveller behaviour conveying the typical travel distribution and traveller behaviour ways generative mechanism and contexts have connected historically to produce unique outcomes. However, the research is guided by ideas about generative mechanism and their contexts so that sequences of cause an effect can be seen to work overtime (Edwards, O’Mahoney and Vincent, 2014 p.33). The focus is on what regard are objective facts and formulate a theory. The data analysis looks for the association between variables and causality (one variable affection another) following the data analysis framework provided. That divided into the following illustrative pathway; Step 1: Description of Events, Step 2: Identification of key components, Step 3: Theoretical re-description (abduction) Step 4: Retroduction: Identification of candidate mechanism; Step 5: Analysis of selected mechanism and outcomes, Step 6: Validation of explanatory power (Bygstad and Munkvold, 2011a). That concentrates in the objective facts and or casualties

or one variable affecting another variable include that the artificial intelligence in business is impacting on the traveller behaviour.

3.6 Reliability and Validity

The choice of sample method determines the quality of the study and quality research findings, and reliability and validity have the overall quality of the study. The present study has no control over the sampling method if another researcher, later on, conducted the same study, the result should be the same (Runeson and Höst, 2009). However, the Internal readability of VisitEngland index in the traveller segmentation might represent an inconsistent index due to the aspirational families with adult sons/daughters fall in the category of fuss-free value seekers (please refer chart 6). In other words, whether not respondents records on any other indicators tend to relate their scores on the other indicators (Alan. Bryman and Bell, 2015 p.169). As noted, the present the study has no controlled over the sampling method, therefore, it relies on Euromonitor International statistical nature taking every attempt to ensure accuracy and reliability (Passport, 2017).

3.7 Limitations

The present study excludes Brexit and social-economic factors that may also disrupt the travel distribution and impact the traveller behaviour. Other limitation includes lack of control of demographic sample, attitudes of the sample and travel reasons attitudes of the sample population from Euromonitor and VisitEngland data.

4. 4.2 Data Findings and Results

4.1 Overview

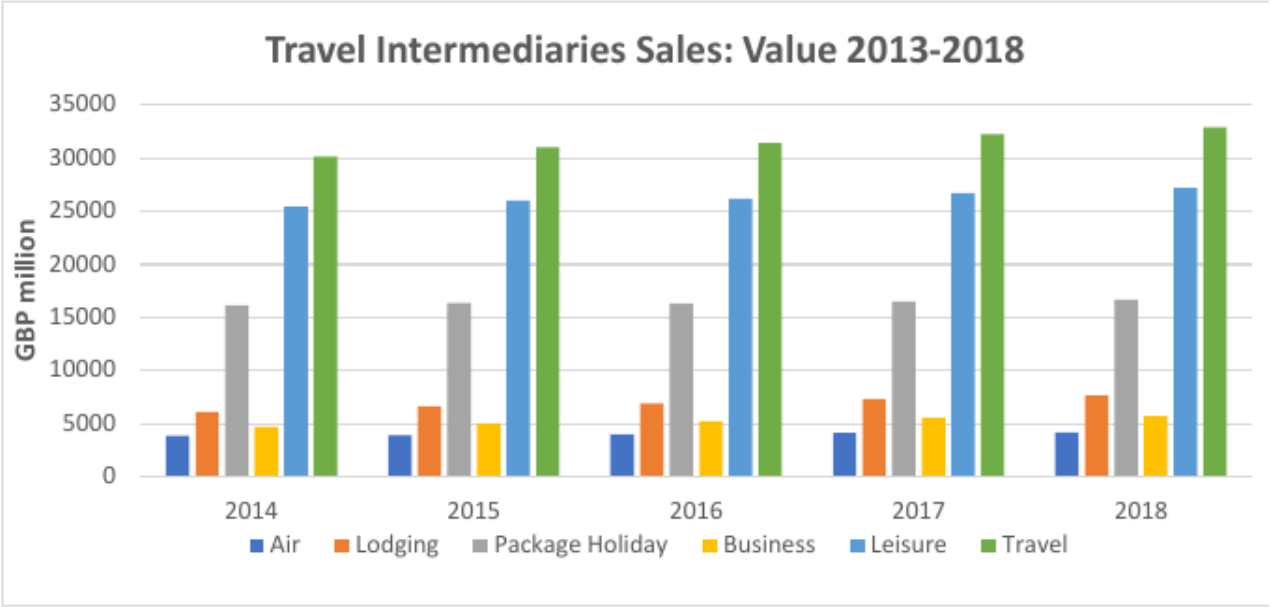
The present study devotes this section in a Critical Realism framework — this section analyses UK traveller behaviour and tourism business intermediates. The data analysis framework is divided into the following illustrative pathway (Bygstad and Munkvold 2011). Step 1; Description of Events in critical realist meaning events are clusters of observations, which obtained and gained by the researcher. Step 2; Identification of key components. The key components are the original objects of the event, for example, Intelligent Travel Agents, and large Tour Operators. They establish structures, i.e. networks of objects, with causal powers. Step 3. Theoretical re-description (abduction) in this section 'Abduction' puzzle the disruptive phenomenon event of Intelligent Travel Agent (ITA) in the travel distribution. And it tries to theorise how ITA harness the UK traveller behaviour. Step 4. Retroduction: Identification of candidate mechanism. In this section research question is answered, and objectives achieved. It is where causal mechanisms account for the disruption of Intelligent Travel Agents in the UK travel Distribution. Step 5; Analysis of the selected mechanism and outcomes. It is when a new mechanism is found. And it can identified others by investigating the connection with other mechanisms. Moreover, asking what it influences on the triggering of the mechanism can find others. Step 6; Validation of explanatory power. It stablish what it does a mechanism more plausible than another. It is the explanatory power with the support of the literature review and data analysis

Finally, the descriptive data analysis were produced for all variables. It is divided into two main sections. First, UK travel distribution. And second traveller behaviour in the UK. Travel behaviour section includes UK outbound and domestic market. Then, description of events of these two sections allows recognising patterns. It support the following theory in discovery/validation. The description of the statistics is in tandem with the literature review.

4.2.1 Description of Events

Chart 1 illustrates that Travel represents the most significant variable on the dataset that is the sum of Business and Leisure that identify a growth sales pattern of growth range £2,803.9 million (9.5%). On the other hand, Package Holiday also shows a tendency sales growth range of £524.9 million (3.15%). There is a significant difference in sales growth pattern between Travel and Package Holidays of 2,279.0 million (6.35%)

Chart 1 – UK Travel Intermediaries Sales values



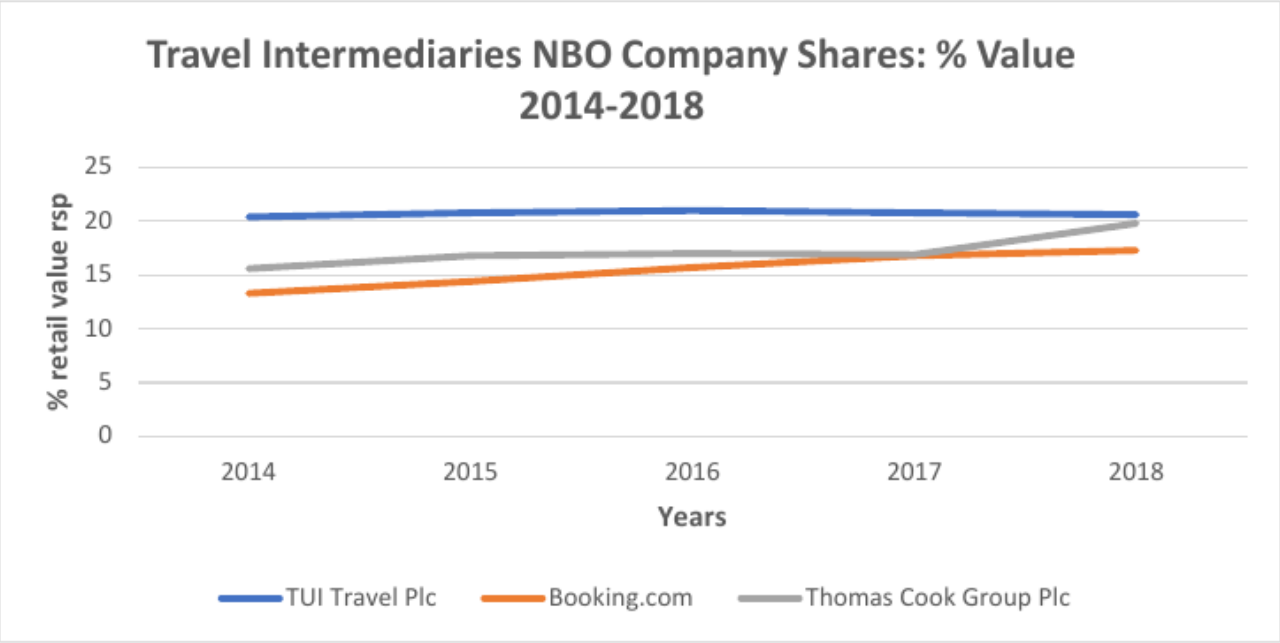
Source: Euromonitor (2018)

Therefore, Travel growth is around the double of Travel package. It also identified that Leisure range is £1776.1 millions that more than three times of the package holidays. In conclusion the illustrated reflects on the standard deviation where the largest is Travel representing £1083 million then Leisure with £679millions, and finally Package holiday with £199 million.

4.2.3 Top UK Travel Intermediaries Company Shares

According to (Tribe, 2016 p.183) In 2014 TUI Travel and its German parent company, TUI AG, merged to create the world's largest tourism business. However, the Literature Review in section 2.3 notes that the travel distribution is seeing an acceleration integrating its products and services. It refers to the disruption of the Artificial Intelligence technology in the business of tourism. It takes into account that Intelligent Travel Agent have the opportunity to disrupt well-established organisations. It is therefore identified that Booking.com falls into the Intelligent Travel Agent. As it uses artificial intelligence (Schaal, 2018).

Chart 2 – UK Travel Intermediaries Company Shares



Source: Euromonitor (2018)

The literature review state that Intelligent Travel Agents start-ups make minor but new notable changes are disrupting in trading patterns. Chart 2 shows the percentage retail value rsp (retail sale price) of top intermediaries organisations on the UK tourism market. As previously noted TUI Travel Plc merged as the world's largest tourism business that reflects on Chart 2. The mean of TUI Travel is 20.72% then followed by Thomas Cook Plc with 16.72% and 15.5%

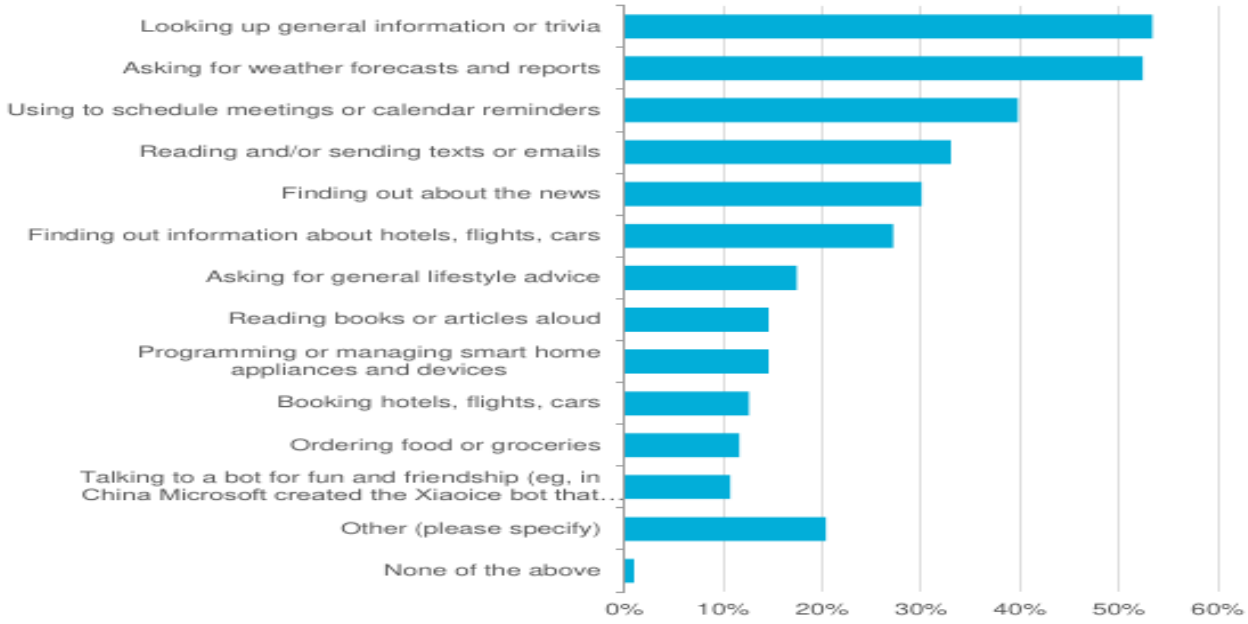
for Booking.com. However, the range of TUI travel is 0.6%, 1.7% for Thomas Cook Plc, and Booking.com with 4%.

Therefore, Booking.com shares price value has the most significant growing tendency on top UK Tourism organisations where Booking.com disrupted Thomas Cook Group in 2017. According to Booking.com (2017) Booking Assistant merges proprietary Artificial Intelligence technology with Booking.com's already-robust new customer service and support chat-bot is now widely available to English-language bookings, handling 30% of those customer questions automatically in less than 5 minutes.

4.2.4 Chat-Bots Automated Assistants

As noted in the literature review the transformation of products and services produce new interactions. It is especially with suppliers to satisfy the new sophisticated travel demand. Travel demand designed by the influence of chat-bots such as Amazon Alexa, Apple Siri, Google now, and so forth on the travellers' purchases decision making. As mentioned in the literature review under the section 2.3.2 provides the example of 'Immir systems' which produce chat-bot technology on an industrial scale.

Chart 3 – Types of Interactions with Automated Assistants in 2017



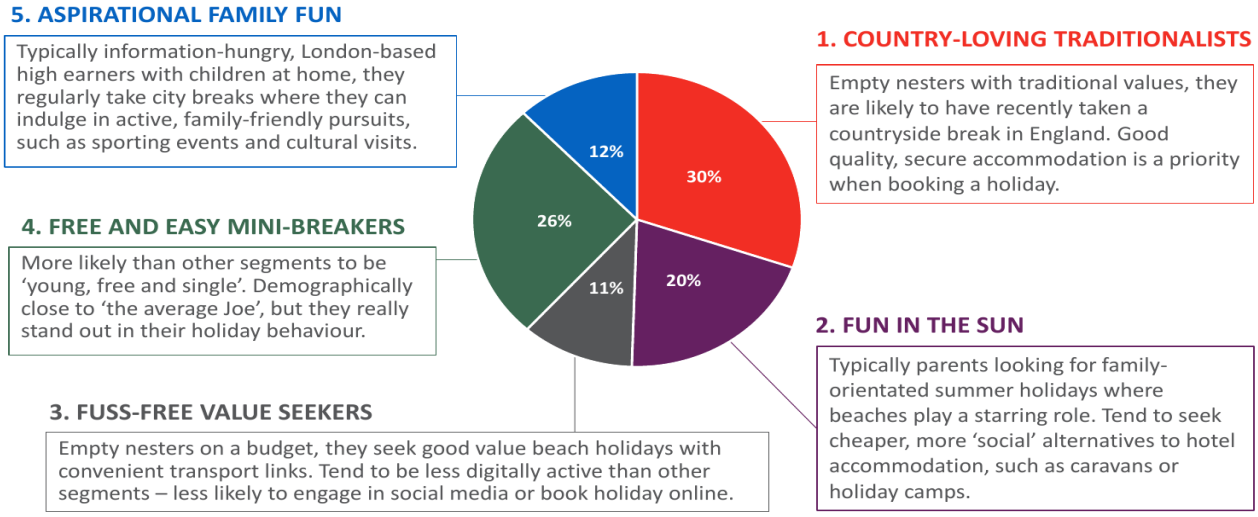
Source: Passport (2017)

Above chart (chart 3) illustrates types of interactions with automated assistants. The highest percentage is that 55% which represent for looking up general information. In this sense, chat-bots or automated assistants are one of the most crucial technology to establish communication. That is between Artificial Intelligence technology and humans. The following category asking for weather forecast and reports that represent 52.5%, and then 40% schedule meetings and calendar reminders 37.5%. After that finding of the news representing 30% the category finding out information about hotels flights, cars 27.5% that compared with the 12.5% of booking hotels cars and trips. Large organisations avoid the inclusion of products and services of competitors in their chart-both cyberspaces. This situation is the opportunity of the startup to create a strategy merges and acquisition building a dynamic Cyber-physical system. Section 2.3 note that demonstration of smart Industry 4.o utilising AI big data, deep learning, integrated into the cyberspace. Cyber-Physical system has the qualities to integrate all the entities in it a system and behave like smart factory.

4.2.5 UK traveller behaviour

As noted in the literature under 2.4.1 section taxonomy is a crucial subject in tourism. Taxonomy in tourism represents expertise learning. It is needed to arrange travel products and services in a hierarchy way. That is according to the market variables. VisitEngland has recently formulated new traveller segmentation. It is based on an assemblage of what factors appeal to visitors. On their travel behaviour, and demographics. This new travel segmentation identifies five main segments.

Chart 4 – UK Traveller Segmentation



Source: Visit England (2018)

It can be observed the following on that on chart four. First, the dynamic relation of traveller market segmentation. That is multilayer, and multidimensional. Where each of the segment perceives values and adapts them to their travel behaviour (literature review). Segment 1 Country-Loving Traditionalists (30%) represent empty nesters with traditional values countryside break in England, good quality. And secure accommodation it is a priority when booking holidays. This segment comprises the highest percentage (30%) in chart 4. And it scores of 8.5 in table 2 that identified as domestic tourism.

Table 2 – UK Traveller Behaviour Index

MEAN SCORES: 0-10 scale – ratings of countries as short break destinations:
"10=perfect country in every way for a short break and 0 = terrible"

	Country-Loving Traditionalists	Fun in the Sun	Fuss-Free Value Seekers	Free & Easy Mini-Breakers	Aspirational Family Fun
England	8.5	8.5	8.3	8.1	8.0
Wales	7.5	7.4	6.8	7.0	7.2
Scotland	7.4	7.1	6.7	7.1	7.2
France	6.3	6.4	5.6	6.7	7.0
Spain	5.9	6.2	5.7	6.5	6.9
Ireland	6.6	6.7	6.1	6.8	7.1

Green indicates higher score in the matrix, Yellow is medium, and Red indicates lower score in the matrix

	Country-Loving Traditionalists	Fun in the Sun	Fuss-Free Value Seekers	Free & Easy Mini-Breakers	Aspirational Family Fun
England	103	102	100	97	96
Wales	104	102	94	97	99
Scotland	103	99	94	100	100
France	99	99	87	104	109
Spain	95	101	91	105	112
Ireland	99	100	92	102	106

Blue indicates higher index in the matrix, Red indicates lower index in the matrix

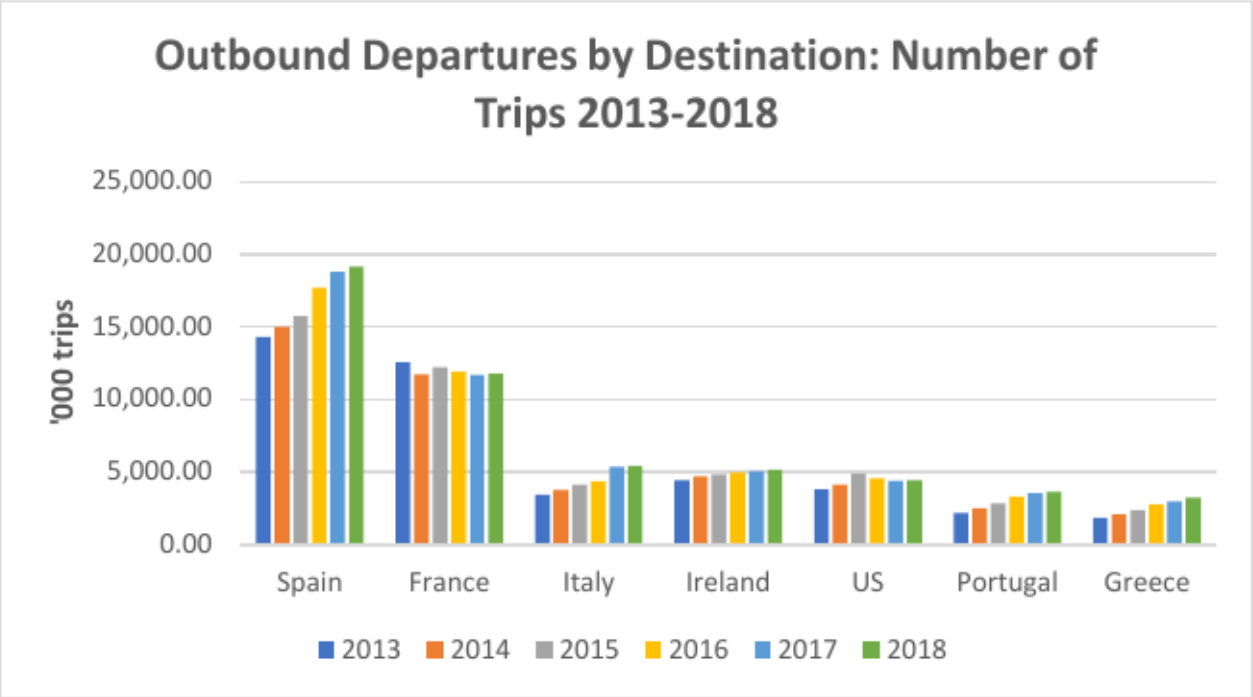
Blue text indicates higher average comparing column-wise
Red text indicates lower average, comparing column-wise

Source: kubikallo (2016)

As above chart shows Segment 1 represents UK domestic tourism. That confirms the results in the previous table. Besides, Segment 2 Fun in the sun defined as parents looking for social beach summer holidays, cheaper to hotel accommodation, such as caravans or holiday camps. It also represents UK domestic tourism. On the other hand, Segment 3 Fuss free value seekers Empty nesters on a budget seeking beach value, represents (11%) on chart 4 that start taking international short break holidays less likely engage in social media and digital purchases that other segments. Segment 4 Free and easy mini-breakers (26%) Young free and single average traveller but stand out in their package behaviour. In table 5 this segment represents the second highest index in the matrix. The literature review also noted that the process of productions in response to the tourism consumption knowledge engineering engage with competitive advance. In chart 4, Segment 5 Aspirational family fun (12%) family-friendly sports events and cultural Information-hungry, London Based high earners with children at home regularly take city breaks with activities. In table 4 this segment represents (112) indicating the higher index in the matrix visiting Spain. The literature review noted under section 2.2 that start-ups are employing AI technology assist travellers in their knowledge arguing

that traveller demand automatically updates itself that appeals to families fun and activities segmentation.

Chart 5 – UK Outbound Departures by Destinations



Source: International Euromonitor (2018)

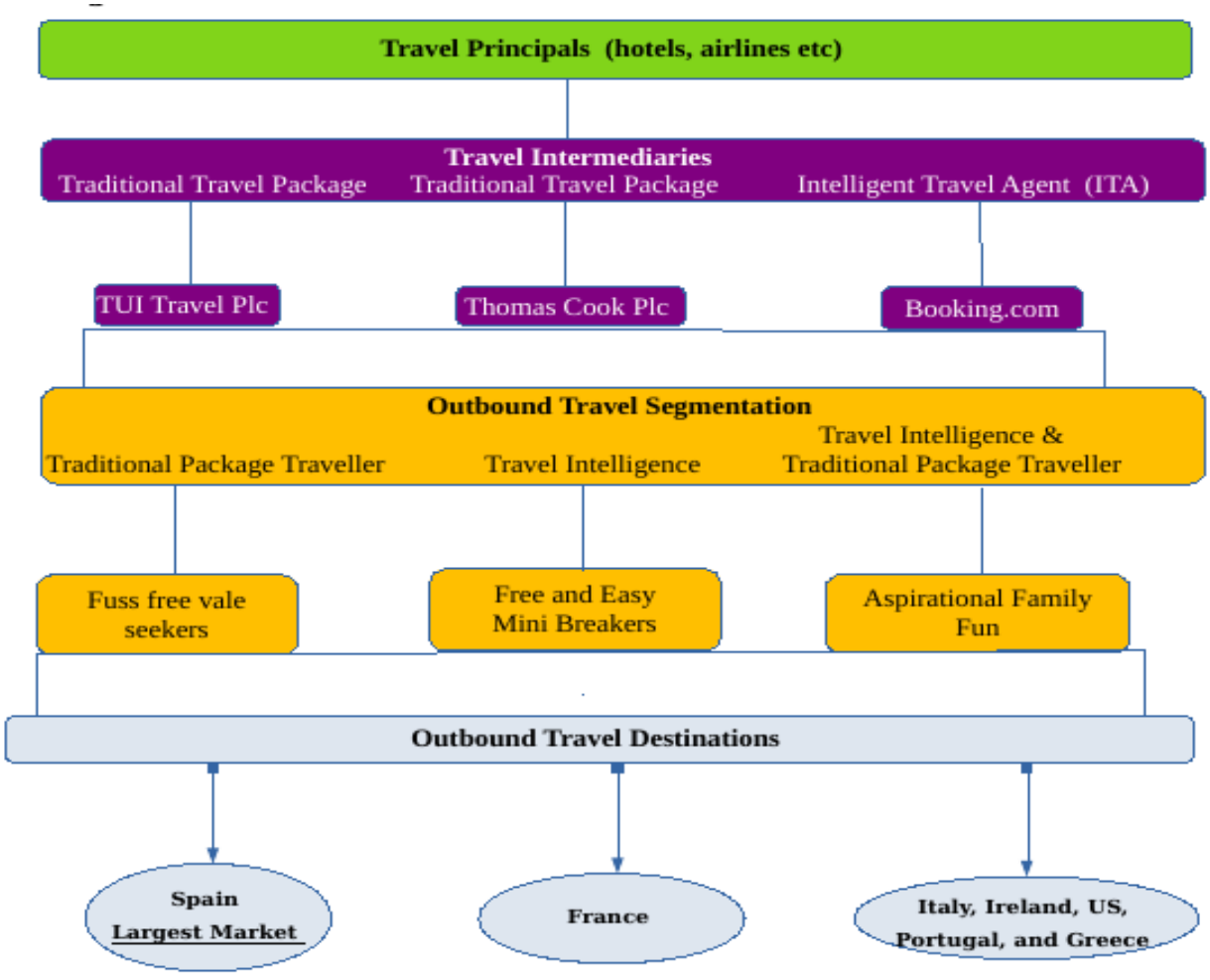
As mentioned above the segments that travel abroad include segment 3 fuss-free value seekers, segment 4 free and easy-mini breakers, and segment 5 Aspirational Family Fun. These three segments represent 50% of the UK traveller market. Chart 7 describes the most visited destinations by the three mentioned segment being Spain with 19,160,000 trips in 2018 is by far the country most visited by the UK travellers. Spain has a consecutive a UK traveller visitors growth along six years (2013-2018) years with a range of 4,826,000.2 trips, standard deviation of 2,032,000 trips and a mean of 1,6786,000 trips. France follows Spain with 11,782,000 in 2018 trips this country has been in decline of UK traveller visitors have a range of 860,000 trips, standard deviation 336,000 trips, and a mean of 1,1990,000. The rest of the countries, if taken individually, remain with no significance, however, if these countries are considered as a group of international markets including Italy, Ireland, US, Portugal, and Greece that represent 18,703,000 in 2018 that 457,000 trips be-

low Spain. Therefore Spain is the most visited country by the three mentioned segments these representing 50% of the total travellers in the UK.

4.5.2 Identification of Key Components (Abstract)

In this section, the present study assembles the data finding with literature review analysing the travel distribution structural, process and cultural dimensions of the selected outbound traveller segments. The Literature review under section 2.1 noted that Intelligent Travel Agents (ITA) represent a radical innovation optimising travel consuming behaviour; fuzzing the roles of tour operators and travel agents. As shown in figure 2 Booking.com is in line with TUI Travel and Thomas Cook Plc that represent a disruption on the UK tourism business market.

Figure 5 – Architecture of the UK Travel Distribution



4.5.2.1 Travel Intermediaries

The first set of analyses examined the impact of the tourism market in sales is Travel that representing £1083 million. Interesting in this data that congregate Business and Leisure that double the Package holiday with £199 million. As noted, TUI Travel Plc represent the largest tour operator in the UK that is representing 20.72 %, then it is followed by Thomas Cook Plc with 16.72%. In Europe, it is the major travel companies, such as Thomas Cook and TUI AG, which dominate the travel agency industry (Beech and Chadwick, 2006). However, Booking.com with 15.5% disrupted Thomas Cook Plc in 2017; therefore, Booking.com shares price value has a significant growing tendency on top UK Travel Intermediaries organisations.

4.5.2.2 Outbound segmentation

Strong evidence of traveller segment fuss-free value seekers empty nesters on a budget seeking beach value found as traditional package traveller representing (11%). This result is significant low comparing segment free and easy mini-breakers (26%) Young free and single average traveller but stand out in their package behaviour using Intelligent Travel Agents ITA. This segment uses the mobile Intelligent Travel Recommender supporting travellers to complement their product while travelling (Werthner, 2010). Likewise, Aspirational family fun 12% and 112 indicating the higher index in the matrix visiting Spain utilise mobile Intelligent Travel Recommender in complement with their package holiday family-friendly sports events and cultural activities Information-hungry.

4.5.2.3 Outbound Travel Destination

Interestingly, for the mentioned traveller segment Spain has a growth in UK visitors with a range of 4,826,000.2 trips, standard deviation of 2,032,000 trips and the mean score of 1,6786,000 trips. There is no a significant increase of UK visitor associated with France with 11,782,000 in 2018 trips this country has a range of 860,000 trips, standard deviation 336,000 trips, and a mean of 1,1990,000. No significant differences found between Spain and France

with The rest of the countries that group of international markets including Italy, Ireland, US, Portugal, and Greece that represent 18,703,000 in 2018, 457,000 trips below Spain.

4.5.3 Theoretical Re-description (abduction)

In this section ‘Abduction’ puzzle the disruptive phenomenon event of Intelligent Travel Agent (ITA) in the travel distribution and try to theorise related how ITA harness the UK traveller behaviour demand. In other words, this step is the process of abducting an explanatory theory. Other two models are applied deduction and induction; this mode of reasoning is at the heart of Critical Realism which adopts an approach to causality that is known as ‘generative causality’ (Mingers, 2014 p.53). To sum up, this step is divided into three sub-steps, the first 'abduction' to theorise accounting something to the phenomenon, second 'deduction' to explore the consequences, and what other impacts would follow, finally ‘induction’ to confirm theory explanation.

From the *abduction* perspective, it can be identified that Travel variable is the largest market and grow faster than the Package Holiday (please refer chart 1) and represent around the double market size. Therefore, Intelligence Travel Agents (IATA) have a broader market than the traditional package holidays tour operators. That support the stated in the literature review under the section 2.3.2 that the impact and significance of Artificial Intelligent in the travel distribution potentially satisfy broader and deep tourism demands. Based on these two factors market size and supply the following theory is abducted:

> Intelligent Travel Agents utilise *‘Attributive Supply’* where travellers become experts buying products and services in real-time according to their attributes, this new demand disrupts the UK travel Distribution.

Besides, above theory represents the disruptive trading factor creating new trading patterns. UK tour operators disruptions apply '*Distributive supply*' selling package holidays tailored by product executives interpreting and setting the parameters of traveller behaviour McMullan (2006) argue that many UK tour operators are now moving towards flexible "mix-and-match" packages, the overwhelming perception is that the UK tour operators are only unbundling their products because they finally have no choice but to do so. Next, *deduction* explores the consequences of '*Attributive Supply*' to the importance of 'Distributive supply'. It is relevant to mention here Push and Pull' factors. According to Dwyer and Kim (2003), 'Pull factors' regard destination attributes that fulfil visitors' travel motives As noted in chart 4, the market segment *Aspirational family fun* information-hungry, London based high earners with children at home they taking regular city break has been identified the profile that more visit Spain (please refer chart 6). Therefore is deduced that Spain is a destination with a pull factor for Aspirational family segment in which they repetitively visit the mentioned country. Back to the abducted theory stated above, this traveller market segment experienced in the Spanish market move from purchasing Travel Package to the use of Intelligent Travel Agents ITA. By contrast, 'push' factors are key for travel intelligence falling in this category the traveller market segment free and easy mini-breakers the second largest UK traveller segmentation (please refer Chart 4) that more likely than other segments to be the young free and single stand out on their holiday behaviour.

Finally, from the *induction* perspective, it can be observed that the UK outbound tourism is well experienced in Spain and has settled the pull factors or 'Distributive supply'. They repetitive travel to Spain that well-known destinations by UK outbound market and do not need a traveller operator expert (distributive supply). Theorising further, pull factor influence are mainly from social networks friends and families. According to Bhaskar (1979), social structures cannot be observed directly because social structures mechanism has different properties and characteristics from physical ones.

4.5.4 Retroduction: Identification of Candidate Mechanism

According to Bygstad and Munkvold (2011) while there is no established methodology for the identification of mechanisms, there are some key contributions. There is presently no shared body of knowledge on the much particular identification of mechanisms. Mechanisms are unobservable, and therefore their description is bound to contain concepts that do not occur in empirical data. They have identified alone a logic, for conjecturing mechanisms. After, theoretical Re-description (abduction) section, the research question could be reformulated;

- In what ways do Artificial Intelligence disrupt the travel distribution and impact on traveller behaviour?

This step is the most crucial, it formulates the research question and restates the two research objectives. The research objectives will be dealt it into two sub-steps. Sub-step 1: The interplay of objects. This sub-step identifies the interplay causal mechanism of Intelligent Travel Agents (ITA). It also includes outbound UK tourism market. This approach suggests two essential mechanisms. First, the socio-technical mechanism that supports a view of the relationship between travellers and technology. According to Whitworth and Ahmad (2010) socio-technical studies should combine the 'social level alone' then match social needs with the purpose of technologies. Hence, social level of study travel involves knowledge engineering (please refer to section 2.2). Therefore, the purpose of AI Knowledge Engineering in the traveller behaviour represent support in need of heuristic search according to the traveller knowledge acquirements. The key problem with this argument is that describe how the interplay between them constituted the mechanism of socio-technical change. Booking has invested in creating a proprietary artificial intelligence application in the form of a chatbot being used for customer service (Schaal, 2018) As noted in the literature review chatbots play an important role as a mode of communication between the travellers and the machine learning (please refer chart 3). Passport (2017) argues Microsoft has

developed a chatbot, Xiaoice (Microsoft Little Ice) that currently over 20 million people chat with on Sina Weibo, by simulating conversation through machine learning. The key problem with this explanation is that describe how the interplay between them constituted the mechanism of socio-technical change. Booking.com has invested in creating a proprietary artificial intelligence application in the form of a chatbot being used for customer service (Schaal, 2018).

Consequently, there is some evidence to suggest that Booking.com has designed a travel knowledge engineering strategy. Travel knowledge engineering offers a ‘wide array of products and services. Booking Holdings Inc. as a multi-technology holding group disrupts the UK tourism distribution adding values through Booking.com, priceline.com, agoda.com, KAYAK, Rentalcars.com and OpenTable Inc. (Reuters, 2018). It is sure that Booking Holdings Inc. disrupts the travel distribution with Artificial Intelligence integrating travel distribution businesses. Therefore, Booking Holdings Inc demonstrate ‘Smart Factory’ behaviour such as factories in the Industry 4.0. According to ManufacturingTomorrow (2018) the core value of the smart factory happens inside the four walls of the plant; the structure of a smart factory can include a combination of production, information, and communication technologies, with the potential for integration across the entire industrial supply chain.

Sub-step 2 In search for macro-micro and micro-macro mechanisms. This sub-step section aims to identify macro-micro and micro-macro mechanisms in the research objectives. The micro-macro mechanisms, which explain the emergent UK traveller behaviour, i.e. how different components interact in order to produce an outcome at a macro level.

- *Objective 1:* To examine the ways in which Artificial Intelligence can impact UK traveller behaviour.

As noted on the literature review under the section 2.5.3 social networks such as Facebook, Twitter and so forth, create a database that the knowledge-based source for Intelligent Travel Agent. Foss and Teppo (2008) have questioned human nature seriously that has wide connoted for active forms of self-fulfilling prophecy mechanism suggested those socially constructed beliefs of others. The most important of this criticism is that false definition of the travel experience evokes to travel misleading which makes the original false conception come true. However, in this case, the UK travel behaviour markets segment Aspirational family fun, and, free and easy mini-breakers visiting Spain represent experts in the travel distribution equipped with experience by generations (please refer chart 7). Therefore, Booking.com support with Artificial Intelligent the mentioned traveller segments in their travel purchase behaviour visiting Spain to find the best travel offers on the travel distribution. The literature review under section 2.5 note that understanding travel behaviour assists businesses of tourism design their products and services. The literature review under section 2.1 illustrates how these ITA organisations disrupt the UK travel distribution fuzzing the role of tour operators and travel agents. Therefore, they can improve its marketing strategies and satisfy their clients. Thus, the market mechanism is interpreted by defining customer segments. Market-mechanism has positive elements of economics as they can significantly enhance understanding of organisations (Foss and Teppo, 2008). In conclusion, the knowledge of market segments of Booking.com produces ways of ‘Attributive Supply’ disrupting the travel distribution in all its organisation’s scale.

Artificial Intelligence in the UK travel distribution: the macro-micro mechanisms, which explain how the whole enables and constrains the various parts (Bygstad and Munkvold, 2011a).

- *Objective 2:* To critically identify the role of Artificial Intelligence in the UK travel distribution.

Artificial Intelligence (AI) accelerates the integration of products and services in the travel distribution. Section 2.3 note that demonstration of Industry 4.o utilising AI big data, deep learning, integrated into the cyberspace. Cyber-Physical system has the qualities to integrate all the entities in it a system and behave like smart factory.

Artificial Intelligence provides the opportunity to the startup to create a strategy merges and acquisition creating a dynamic Cyber-physical system. Cyber-Physical Systems has the potential to integrate travel distribution in which organisations share information with private and public sectors, carriers, constructed attractions, and accommodation. Therefore, Cyber-Physical Systems demonstrate ‘Smart’ industrial behaviour such as Industry 4.0. Raikov, (2018) argues that Artificial Intelligence seeks solutions in a logical and discrete form blending systems such as Big Data, Deep Learning, Experts' systems, and the Internet of Things (IoT) in the Cyberspace. Therefore, this is similar to Industry 4.0 in which Artificial Intelligent integrate systems in the cyberspace to exchange data to rectify problems in a network structure to optimise the business travel distribution in real-time. It would learn from each other new failures modes change improving itself to be more robust and reliable.

4.5.5 Analysis of Selected Mechanism and Outcomes

The outcome of the market-bound self-reinforcing generative mechanism is contextual, i.e. depends on the other two mechanisms in different contexts. The context of the two mechanisms; the interplay effects mechanism, tourism business chain distribution (figure 1), and the network effects mechanism, travel intelligence (figure2). This contingent causality is blended into all open systems, and propose that it can produce mainly a key mechanism to describe the phenomena: but not to predict it. As illustrated in figures 1 and 2 the market-bound self-reinforcing generative mechanism has two self-reinforcing mechanisms. First, network effects mechanism accelerates the integration of tourism products and services as a result of growth in network-size. At the

macro level the result if the mechanism is the data assemblage increase in the travel distribution infrastructure. Network effects mechanisms describe two key aspects of data infrastructures; how it innovate and how it develops. A precondition for this mechanism to work – as described in the Booking.com case – is a 'smart' travel distribution architecture that allowing the interplay with external service providers, and also the ability of the organisation to engage in rapidly changing travel business networks.

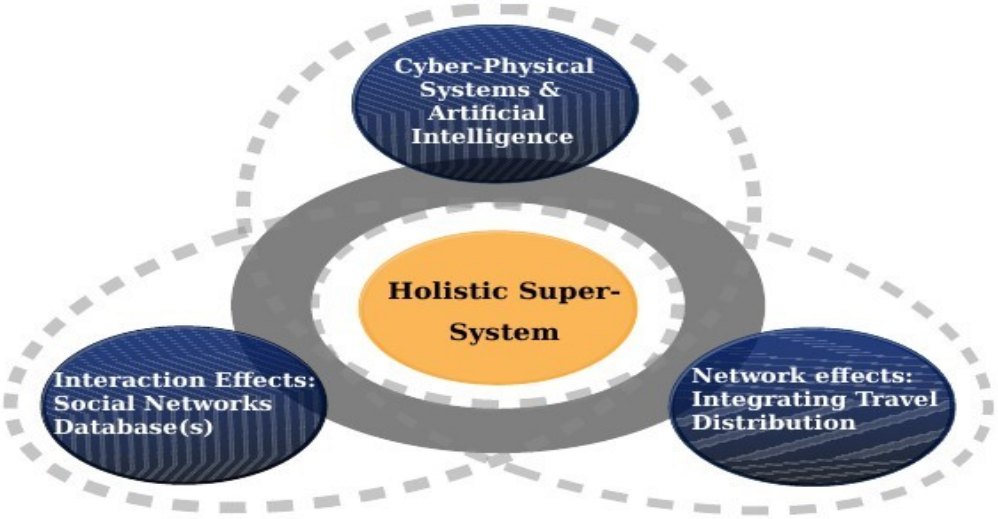
Second, The second mechanism is the self-reinforcing interaction effects associated with traveller information search and preference of products and services formation. The result of this mechanism is more travellers to the information infrastructure. A precondition for this mechanism to work is a degree of traveller preferences. The mechanism explains traveller information search and preferences in the interaction of Facebook, Twitter, Google and other social platforms. To sum up, self-reinforcing interaction effects describes 'smart' bundles of products and services that allow for personalised travel behaviour at different traveller segmentations.

In conclusion, Market-bound Self-reinforcing mechanism compress two mechanisms. One, Network Effects mechanisms which expand the integration of tourism business products and services. The outcome of this mechanism is to optimise performance to exchange information. It grows in network-size. Two, Interaction Effects represent the data of travellers social network produces by their products and services preferences.

Booking Holdings goal provides an example of Market-bound Self-reinforcing mechanism. Fogel said Booking Holdings, parent of the Booking.com and Priceline.com brands, designs to overhaul its search and sorting function, with the goal of delivering more relevant, customised results. "We have 142 million photos, and we're using visual AI that can come up with how to connect what you've liked in the past with what you'd like to do in the future," he said.

The goal is to create a "holistic super-system" that leverages Booking Holdings' customer data, AI capabilities and other resources (Christina-jelski, 2018).

Figure 6 – Booking Holdings: Market-bound Self-reinforcing Mechanism



Macro-micro mechanism section noted the importance of social networks 'Interaction Effects' to create a database that the knowledge-based source for Intelligent Travel Agents. Low levels of definition of market boundaries amount in the mass tourism products and services as is largely the case for UK traveller markets Aspirational family fun, and, free and easy mini-breakers represents 38% of UK total traveller market. Geoffrey R. Brooks (1995) Defines marker- boundaries amount to the delineation of the market where firms' products are undifferentiated, i.e. Spain UK visitors with a range growth of 4,826,000.2 trips, standard deviation of 2,032,000 trips and the mean score of 1,6786,000 trips please refers (data analysis section 4.5.2.3). Kozak and Martin (2012) provides an example of the UK traveller market visiting Spain ' between 1960 and 1970 Spain underwent into one of the Mediterranean first mass tourism destinations. Spain with 19,160,000 trips in 2018 is by far the country most visited by the UK travellers. Therefore Spain offers the largest

‘Travel market’ to apply Booking Holdings ‘Holistic Super-systems’ strategy. Market-bond self-reinforcement mechanism explain along its two mechanisms the strategy. First ‘Interaction Effects’ differentiating products and services of the UK outbound travel behaviour where Artificial Intelligence (AI) will learn at different knowledge levels according to the traveller knowledge level to differentiate/personalise products and services (please refer literature review section 2.2). Second, network effects in market-bound self-reinforcing mechanism come optimisation of using products and services becomes more massive as its network grows in size (Geoffrey R. Brooks, 1995). It, therefore, justifies the integrating systems in the cyberspace to exchange data to rectify problems in a network structure to optimise the business travel distribution in real-time (please refer literature review section 2.3).

4.5.6 Validation of Explanatory Power.

What makes a mechanism more plausible than another is the explanatory power. It is with the support of the literature review and data analysis. In the case of Booking.com, two other conceivable mechanisms occurred consistently. They were appraised against the data analysis. First, it was appraised whether Artificial Intelligence in the business of tourism could be explained with the socio-technical mechanism. That is the link between society and technology. Its was argued that it should include the ‘social level alone’. After that, it needs to meet social needs with technology. Indeed, this explanation is too general. But it cannot be excluded from the literature review supported. It was also supported by the data analysed. There was no systematic process at the socio-technical mechanism to inspect and state a plausible explanation. Alternatively, in a closer look, it can be considered the key generative mechanism. That it was self-reinforcing mechanisms integrating travel distribution. Again this mechanism could describe some of the noted outcomes. But it is not competent. For example, it emerged through the study that although self-reinforcing mechanisms exclude travellers needs, it was important to identify that lock-in does not occur. Hence, a plausible generative mechanism should include intrinsically two mechanisms. First, one

designating the travel distribution. And the second one designed the traveller behaviour. Thus, the result of this analysis was that although several mechanisms account to explain the phenomenon of Artificial intelligent in the business of tourism, the key mechanisms did not include a clear link between traveller behaviour interaction and travel distribution network. Therefore Market-bond self-reinforcement mechanism is the key mechanism. That includes 'interaction effect' for traveller behaviour, and ‘network effect’ for the travel distribution as the most plausible explanatory power but also constitute the evidence for further discussion.

5 Conclusion and Recommendations

5.1 Overview

In conclusion, the present research study has interpreted the disruptive factors of Artificial Intelligence in traveller behaviour and travel distribution. In the UK travel distribution, the study illustrated the disruption of the new Intelligent Travel Agents (ITA) business model. It took into account the impacts of Booking.com in the travel distribution. However, this organisation is under the umbrella of Booking Holdings including Booking.com. As identified Booking Holding has created a technological group company cover most of the organisations in the traveller distribution. It can be argued that the strategy of Booking Holdings has been described along the literature review.

On the other hand, the present study illustrated the disruptive factors of Artificial Intelligence on traveller behaviour. Artificial Intelligence AI has capacities to create sub-segmentations in mass tourism. It applies Knowledge Engineering adding values individually to the traveller. It will, therefore, reorganise the demand in the travel distribution.

These technological strategies create new traveller markets. It includes some similarities with industry 4.0 project that rearranging tourism products and services matching products and services through Cyber-Physical Systems algorithms. Chat-bots and Virtual Personal Assistants powered by Artificial Intelligence achieve new demand for optimising budget in real-time. As noted in the literature review that potentially affects travellers heuristics and intuition. It will impact travellers learning and discover along the travel distribution.

5.2 Research Methodology

In conclusion, the methodology chapter explained and justified all research methods. It described the research design, secondary official statistics data collection techniques. Also, this chapter justified the Descriptive Statistical approach to data analysis. It explained the research strategy orientation in analysing quantitative secondary data. It is one of the first studies to

undertake a longitudinal analysis of the UK the tourism distribution. And analyse the UK travel behaviour with Critical Realism philosophy. In this chapter, the Critical Realism philosophy was justified. It is a reality of the natural order and the events of and discourses of the social world’. Therefore, the philosophy of the present research study was designed to recognise and describe the underlying generative mechanism. It did not aim to uncover general laws. It was clear from the Critical Realism perspective that the role of modelling. It should be that of explanation and understanding rather than prediction. Critical realism ontology mechanism explanation is not a form of fundamentalist explanation. It does not have to localise in a purely physical sense. But the causal mechanism needs to be bounded, and demarcated, within their space of interaction.

The ontology and epistemology of Critical Realism was explained in this chapter. This named as Layered ontology as the core centre of the present critical realist methodology. It differs from a positivist research methodology. This investigates regularities at the level of events. But alternatively, shows and explain the mechanisms that produce the event. Finally, the methodology chapter included the reliability and validity of the present study. It noted that the choice of a sample method determines the quality of the study. That the quality of the research findings and reliability and validity. It gives the overall quality of the study. However, the present study has no control over the sampling method. However, It lacks control of Euromonitor and VisitEngland data demographic sample, attitudes of the sample and travel reasons attitudes.

5.3 Research Findings and Results

Returning to the research question and objectives stated at the beginning of this study, it is now possible to conclude with the following. First, the identification of Booking.com confirmed the disruption of Artificial Intelligence in the travel distribution. And how it impacts on the traveller behaviour. Besides descriptive data analysis provided the UK intermediaries sales (chart 1) showed

a pattern growth of the Travel variable. It grows the double of Travel package. It represents a market opportunity for startups such as Booking.com and KAYAK. Those are under the same umbrella Booking Holdings. This Travel variable market offers an opportunity to Booking Holdings in personalised mass tourism travellers in sub-segments. It is, therefore, the creation of new markets. And also develop new business of tourism. As identified in chart 2, Booking.com percentage retail value rsp (retail sale price) the range of TUI travel is 0.6%, 1.7% for Thomas Cook Plc, and Booking.com with 4%. That represents a stable growth along five years (2014-2015). In conclusion, The recent investment of Booking.com in Virtual Personal Assistants or chatbots confirms the importance of those. It is reflected in the literature review. However, chart 3 illustrated that Virtual Personal were used only 12.5% in 2017 for booking hotels and cars. But only at the time of booking it can be for looking up general information about holidays destinations and other travel information, then booking on the website.

To sum up in the traveller behaviour, Aspirational Family Fun and free, easy mini breakers that are representing 38% are mostly visiting Spain. Spain is the largest and growing destination for UK outbound market (please refer section 4.2.5).

In the identification of key components section (figure 5) the architecture of the UK tourism in abstract demonstrates three levels of interaction. First and most important is the travel principals. Then is the travel intermediaries. After that outbound segmentation. And finally is the outbound travel destination.

In conclusion, the theory abducted in section 4.5.3 coined the phrase ‘Attributive Supply’. It is when travellers become experts buying products and services in real-time according to their attributes. This new demand disrupts the UK travel distribution. On the other hand, the theory shows the downside of package holidays. They are tailored by product executives. It is distributed to the demand by the tour operators that coined ‘Distributive supply’. Finally,

the last sections chapter in a systematic and creative way searched for of a generative mechanism. It found that Booking Holding strategy Artificial Intelligent phenomenon in the UK distribution market. Eventually, Self-reinforcing Mechanism Market-bound (Crouch and Ritchie, 1999) that interaction effects associated with information search and preference formation of traveller behaviour. It is along with business network effects related to the economic utility as a result of actual growth in network-size that in the UK travel distribution.

5.4 Recommendations

5.4.1 Overview

Having stated the research findings contribute to the current research. This chapter provides recommendations for tourism management practices. It also suggests future research in Artificial Intelligence in the business of tourism. Within this discussion, several recommendations on the shape of its future can be included. First, it is in the field of business organisation of the travel distribution. Second, it stresses the travel behaviour.

The results of the recommendations came out from the outcome of the market-bound self-reinforcing generative mechanism. It depends on the other two mechanisms in different contexts. The context of the two mechanisms the interplay effects mechanism, tourism business chain distribution (figure 1), and the network effects mechanism, travel intelligence (figure2).

The recommendations embrace the traveller behaviour throughout the travel lifecycle. It is most notably while the traveller is on the go during the trip. During the period the traveller purchase products and services. It is the real-time context what makes the strategy. Since Booking.com strategy parameters are fitting with the literature review theories. The literature review is interpreting in a such a way that as a holistic super system (refer figure 6). Booking.com holistic super-system incorporates the two research objectives.

The first represented 'Interaction Effects' for traveller behaviour(objective 1, section 4.5.4.) The second, Network Effects ‘Network Effect’ designated the travel distribution configuration (objective 2, section 4.5.4).

5.4.2 Intelligent Travel Agents

This study suggests to the Intelligent Travel agents management follow the Self- reinforcement Market-bound generative mechanism philosophical approach. It transforms the tourism services into smart services. In addition to developing new commercial networks. Market-bound Self-reinforcing Mechanism. That comprises interplay effects mechanism in the context of two mechanisms. They include the tourism business chain distribution (figure 1) its effects mechanism. And it is travel intelligence behaviour (figure2).

The first represented 'Interaction Effects' for traveller behaviour (objective 1, section 4.5.4.). Booking.com as a disruptive technological organisation integrating assets across the travel distribution. For example, Booking has invested in designing an exclusive artificial intelligence application. Booking.-com CEO thinks that automating parts of traveller assistance for some of most commonly asked questions. It is as well as making smarter recommendations for lodging choices. These are both parts of the new equation. As a result, Virtual Personal Assistants powered by Artificial Intelligence produce smart services. Smart services reorganise tourism products and services which accelerates the integration of tourism products and services. As a result, smart services optimise the business travel distribution in real-time. Due to the development of new commercial networks will disrupt top players on the market.

The second, Network Effects ‘Network Effect’ designated the travel distribution configuration (objective 2, section 4.5.4). That is the business management style. It is automated in line with the automation of travel purchase behaviour. This is the new management of the business in travel distribution by their new services. It creates new markets matching products and services following travel behaviour evaluative criteria thinking abilities. The inclusion of

traveller products and services results on growth network-size of supply of Intelligent Travel Agent. Therefore the result of this the mechanism is the data assemblage increase in the travel distribution infrastructure. The increment of information in the travel distribution infrastructure provides the background of how it innovate and how it developed as an Intelligent Travel agency (ITA). It also is essential to ensure the best travel deal in real-time. Moreover, smart services of chatbots powered by artificial intelligence integrate business systems in the cyberspace. It exchanges data to rectify problems in a network structure. To sum up, these technological strategies create new travellers markets.

5.4.3 Corporate Social Responsibility (CRS)

The present research recommends that Corporate Social Responsibility should be at the heart of the Intelligent Travel Agents. In such that a case where small companies to which certain legislation (eg, CRS-Directive 2014/95/EU or UK Modern Slavery Act from 2015) does not apply have to fulfil their clients' obligations as well (Wisskirchen *et al.*, 2017). Since Tourism businesses utilise Artificial Intelligence (AI) applications to personalise its products and services. The creation of the new markets in the UK travel distribution would lead to new types of travellers. For example, machine learning with statistical approaches. It renders the probabilist nature of the traveller thinking ability. The algorithms of this smart technology adopt features from human intelligence. Despite being based on computer algorithms science AI has significant links with other subjects sections such as sociology, philosophy, psychology, cognition and others. For instance, misleading of the Intelligent Travel Agents with algorithmic bias learning bad practices of the traveller behaviour especially from the mass tourism. Therefore, according to Grosz et al., (2015) Rather than "more" or "stricter" regulation, policies should be designed to encourage helpful innovation. In generating and transfer expertise, and foster broad corporate and civic responsibility for addressing critical societal issues raised by AI technologies.

Finally, this study has thrown up many questions in need of further research. It would be utterly important to assess the effects of Artificial Intelligence capabilities in human knowledge. It regards how travellers will be affected whereby cognitive and emotional factors. These factors are in the traveller learning and evaluative criteria of products and services along the travel distribution. Due to human intelligence in traveller behaviour is how and why travellers purchase or not products and services. For example, some studies indicate that most travellers make their purchases decisions using fast, intuitive rather than the witting, step-by-step deduction. It will affect travellers heuristics and intuition. Unique to learn and discover products and services by themselves. Given that how Artificial Intelligence affects traveller thinking ability in bundling their products and services.

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7 Appendices

Appendix 1 – Travel Intermediaries Sales: Value 2013-2018

GBP million	2013	2014	2015	2016	2017	2018
Intermediaries Air Sales Only	3,837.8	3,866.2	3,931.5	3,979.5	4,115.0	4,160.6
Intermediaries Car Rental Sales Only	402.6	409.5	417.2	414.7	419.6	421.2
Intermediaries Cruise Sales	2,324.6	2,219.0	2,405.9	2,484.3	2,608.6	2,749.1
Intermediaries Other Transport Sales Only	842.6	852.1	854.7	838.8	846.2	855.6
Intermediaries Lodging Sales Only	5,634.6	6,124.6	6,608.6	6,930.0	7,326.2	7,654.8
Intermediaries Package Holidays Sales	15,904.6	16,174.2	16,363.3	16,334.8	16,516.1	16,699.1
Intermediaries Other Sales	508.8	494.9	476.0	443.5	427.3	404.0
Intermediaries Online Sales	16,524.2	17,577.5	18,736.1	19,499.2	20,611.4	21,509.9
Intermediaries Offline Sales	12,931.2	12,563.0	12,321.0	11,926.6	11,647.5	11,434.4
Intermediaries Corporate Business Sales	4,408.3	4,709.2	5,018.7	5,238.1	5,525.2	5,736.9
Intermediaries Leisure Sales	25,047.2	25,431.3	26,038.4	26,187.7	26,733.7	27,207.4
Travel Intermediaries	29,455.4	30,140.4	31,057.1	31,425.8	32,258.9	32,944.3

Leisure		*Travel*	
Mean	26319.7	**Mean**	31565.3
Standard Error	303.744592	**Standard Error**	484.292755
Median	26187.7	**Median**	31425.8
Mode	#N/A	**Mode**	#N/A
Standard Deviation	679.193555	**Standard Deviation**	1082.91152
Sample Variance	461303.885	**Sample Variance**	1172697.37
Kurtosis	-0.4822687	**Kurtosis**	-0.69476537
Skewness	0.05950178	**Skewness**	-0.02328115
Range	1776.1	**Range**	2803.9
Minimum	25431.3	**Minimum**	30140.4
Maximum	27207.4	**Maximum**	32944.3
Sum	131598.5	**Sum**	157826.5
Count	5	**Count**	5
Largest(1)	27207.4	**Largest(1)**	32944.3
Smallest(1)	25431.3	**Smallest(1)**	30140.4
Confidence Level(95.0%)	843.330185	**Confidence Level(95.0%)**	1344.61225

Package Holiday		Business	
Mean	16417.5	**Mean**	5245.62
Standard Error	88.8797896	**Standard Error**	181.496097
Median	16363.3	**Median**	5238.1
Mode	#N/A	**Mode**	#N/A
Standard Deviation	198.741251	**Standard Deviation**	405.837612
Sample Variance	39498.085	**Sample Variance**	164704.167
Kurtosis	-0.03398267	**Kurtosis**	-1.09684788
Skewness	0.43323879	**Skewness**	-0.15964813
Range	524.9	**Range**	1027.7
Minimum	16174.2	**Minimum**	4709.2
Maximum	16699.1	**Maximum**	5736.9
Sum	82087.5	**Sum**	26228.1
Count	5	**Count**	5
Largest(1)	16699.1	**Largest(1)**	5736.9
Smallest(1)	16174.2	**Smallest(1)**	4709.2
Confidence Level(95.0%)	246.769857	**Confidence Level(95.0%)**	503.913951

Source: Euromonitor (2018)

Appendix 2 – Travel Intermediaries NBO Shares: % Value 2014-18

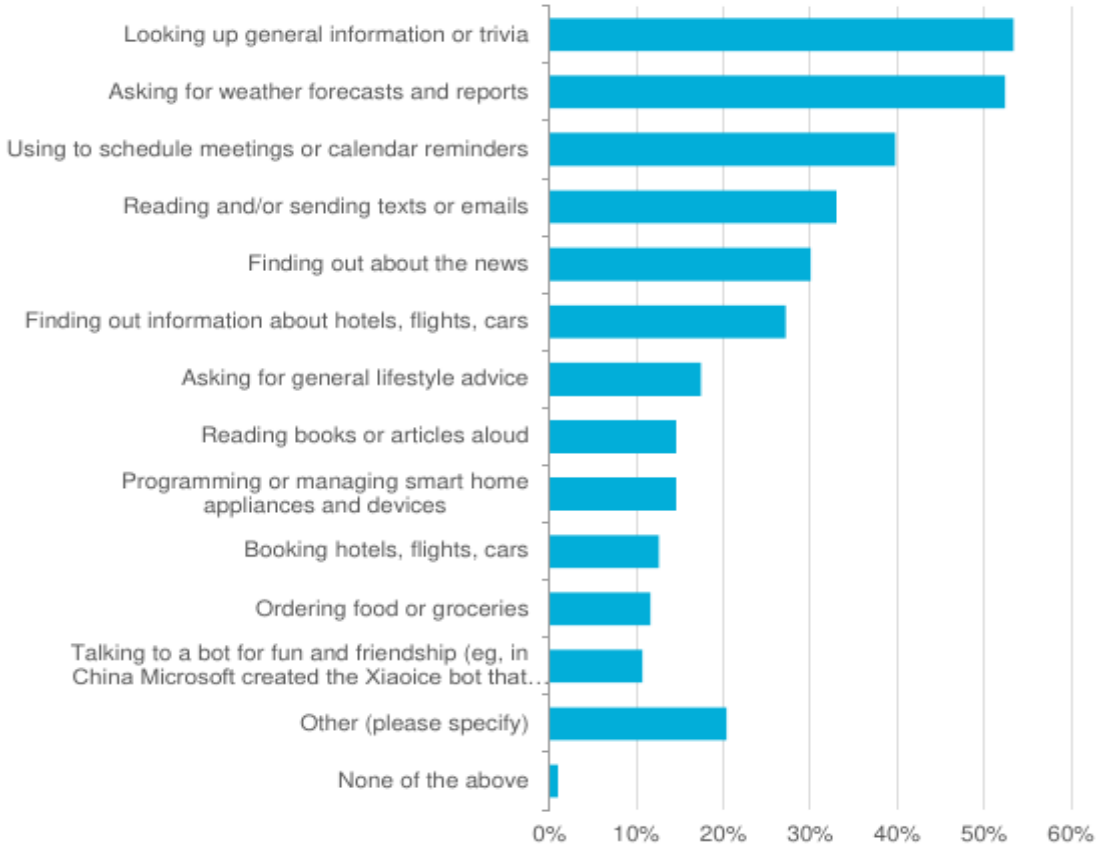
% retail value rsp Company	2014	2015	2016	2017	2018
TUI Travel Plc	20.4	20.8	21.0	20.8	20.6
Booking.com BV	13.3	14.4	15.7	16.8	17.3
Thomas Cook Group Plc	15.6	16.8	17.0	16.9	16.8
Expedia Group Inc	-	-	-	-	5.5
British Airways Plc	2.3	2.3	2.3	2.3	2.3
On the Beach Ltd	1.3	1.4	1.6	1.7	2.2
Virgin Holidays Ltd	2.0	2.0	2.0	2.1	2.1
Flight Centre Travel Group Ltd	2.6	2.3	2.2	2.2	2.1
Trailfinders Group Ltd	1.6	1.8	1.9	2.0	2.0
Travel Republic Ltd	1.5	1.5	1.6	1.6	1.6
Jet2holidays Ltd	1.6	1.6	1.6	1.6	1.6
Travelocity.com LP	1.3	1.3	1.3	1.3	1.3
American Express Co	1.2	1.3	1.3	1.3	1.3
LateRooms Ltd	1.1	1.1	1.1	1.1	1.1
Opodo Ltd	0.8	0.8	0.8	0.8	0.8
Hotelopia Holidays SLU	0.8	0.8	0.8	0.8	0.8
Cosmos Coach Tours Ltd	0.8	0.8	0.8	0.8	0.7
Co-op Group Travel 1 Ltd	0.7	0.6	0.6	0.6	0.6
Orbitz Worldwide (UK) Ltd	1.0	0.5	0.5	0.5	0.5
Travix International BV	0.3	0.3	0.3	0.3	0.3
Expedia Inc	3.6	4.2	4.7	5.3	-
Co-operative Group Ltd, The	-	-	-	-	-
Flight Centre Ltd	-	-	-	-	-
Others	26.2	23.4	20.8	19.2	18.4
Total	100.0	100.0	100.0	100.0	100.0

TUI Travel Plc		*Booking.com*	
Mean	20.72	**Mean**	15.5
Standard Error	0.10198039	**Standard Error**	0.742293742
Median	20.8	**Median**	15.7
Mode	20.8	**Mode**	#N/A
Standard Deviation	0.228035085	**Standard Deviation**	1.659819267
Sample Variance	0.052	**Sample Variance**	2.755
Kurtosis	-0.177514793	**Kurtosis**	-1.701437084
Skewness	-0.404796009	**Skewness**	-0.359188955
Range	0.6	**Range**	4
Minimum	20.4	**Minimum**	13.3
Maximum	21	**Maximum**	17.3
Sum	103.6	**Sum**	77.5
Count	5	**Count**	5
Largest(1)	21	**Largest(1)**	17.3
Smallest(1)	20.4	**Smallest(1)**	13.3
Confidence Level(95.0%)	0.283142955	**Confidence Level(95.0%)**	2.060937828

Thomas Cook Group Plc	
Mean	16.72
Standard Error	0.292232784
Median	16.9
Mode	#N/A
Standard Deviation	0.65345237
Sample Variance	0.427
Kurtosis	3.61308404
Skewness	-1.764363331
Range	1.7
Minimum	15.6
Maximum	17.3
Sum	83.6
Count	5
Largest(1)	17.3
Smallest(1)	15.6
Confidence Level(95.0%)	0.811368283

Source: Euromonitor (2018)

Appendix 3 – Types of Interactions with Automated Assistants in 2017



Types of Interactions with Automated Assistants 2017

Mean	27.40909091
Standard Error	4.751467803
Median	28
Mode	#N/A
Standard Deviation	15.75883591
Sample Variance	248.3409091
Kurtosis	-1.073758358
Skewness	0.523353125
Range	42.5
Minimum	10
Maximum	52.5
Sum	301.5
Count	11
Largest(1)	52.5
Smallest(1)	10
Confidence Level(95.0%)	10.58693002

Source:

Source: Passport (2017)

Appendix 4 Outbound Departures by Destination: Number of Trips 2013- 2018

'000 trips	2013	2014	2015	2016	2017	2018
Spain	14,333.8	15,000.7	15,764.0	17,675.4	18,779.4	19,160.0
France	12,549.0	11,751.0	12,233.0	11,938.0	11,688.7	11,781.6
Italy	3,443.3	3,767.9	4,153.1	4,363.0	5,354.0	5,456.4
Ireland	4,444.0	4,715.0	4,838.0	4,990.0	5,072.1	5,166.1
US	3,835.2	4,148.9	4,900.8	4,573.7	4,392.4	4,455.6
Portugal	2,206.9	2,493.8	2,855.3	3,287.6	3,557.6	3,625.1
Greece	1,846.3	2,089.5	2,397.2	2,782.6	3,002.0	3,236.0
Germany	2,294.1	2,415.5	2,559.7	2,551.1	2,612.3	2,630.1
Netherlands	1,679.7	1,856.5	1,966.8	2,045.0	2,195.0	2,285.0
United Arab Emirates	1,356.2	1,505.2	1,689.8	1,820.2	1,856.3	1,752.3

Source: UNWTO, Euromonitor International from official statistics, trade associations, trade press, company research, trade interviews, trade source

Spain		*France*	
Mean	16785.55	**Mean**	11990.21667
Standard Error	829.5704839	**Standard Error**	137.3034314
Median	16719.7	**Median**	11859.8
Mode	#N/A	**Mode**	#N/A
Standard Deviation	2032.024391	**Standard Deviation**	336.3233469
Sample Variance	4129123.127	**Sample Variance**	113113.3937
Kurtosis	-2.325446256	**Kurtosis**	0.009344174
Skewness	0.018897384	**Skewness**	1.091896309
Range	4826.2	**Range**	860.3
Minimum	14333.8	**Minimum**	11688.7
Maximum	19160	**Maximum**	12549
Sum	100713.3	**Sum**	71941.3
Count	6	**Count**	6
Largest(1)	19160	**Largest(1)**	12549
Smallest(1)	14333.8	**Smallest(1)**	11688.7
Confidence Level(95.0%)	2132.478817	**Confidence Level(95.0%)**	352.9497068

Source: Passport (2017)

Supervisory

Record of Supervision

Student name Oscar Rodriguez Fernandez **Student number** 1207792

School School of Business and Law **Programme** MSc International Business Management

Supervisor name Dr Henrik Linden

Date of supervision session 17/10/2018

Summary of main points of discussion

Methodology (especially what aspects of Critical Realism to be focused on and adapted to the study)

Any agreed actions for student
Complete the methodology section (making it clear how the methodology fits with the study)
Start working on the analysis

Any agreed actions for supervisor / supervising team
Check draft when sent

Agreed date for next supervision TBC

Student signature [redacted]

Supervisor signature [redacted]

Record of Supervision

Student name Oscar Rodriguez Fernandez **Student number**1207792

School School of Business and Law **Programme**MSc International Business Management

Supervisor name Dr Henrik Linden

Date of supervision session ……13/09/2018……..

Summary of main points of discussion

The main focus of the discussion was the literature review (comments can be found on the hard copy)
We also touched upon the methodology and discussed possible ways forward

Any agreed actions for student
Make some minor amendments to the literature review
Develop the methodology section

Any agreed actions for supervisor / supervising team
n/a

Agreed date for next supervision ……Early/mid October…….

Student signature [redacted]

Supervisor signature [redacted]

Record of Supervision

Student name Oscar Rodriguez Fernandez **Student number**1207792

School School of Business and Law **Programme.**MSc International Business Management

Supervisor name Dr Henrik Linden

Date of supervision session ……Various dates in July (via email)……..

Summary of main points of discussion

Research objectives
Literature review

Any agreed actions for student
Develop the literature review
(Comments via email)

Any agreed actions for supervisor / supervising team
Read draft

Agreed date for next supervision ……Early September……

Student signature [redacted]

Supervisor signature [redacted]

Record of Supervision

Student name Oscar Rodriguez Fernandez **Student number**1207792

School School of Business and Law **Programme**MSc International Business Management

Supervisor name Dr Henrik Linden

Date of supervision session ……11/06/2018……..

Summary of main points of discussion

We discussed the topic in general and the focus of the research

Any agreed actions for student
Narrow the topic down a little bit
Work on the research objectives
Develop the literature review

Any agreed actions for supervisor / supervising team
Read and comment on draft via email (email conversation and comments throughout July)

Agreed date for next supervision ……TBC…….

Studentsignature[redacted]

Supervisor signature ……[redacted]……